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(71) Applicant: **EOS BIOTECHNOLOGY, INC.** [US/US]; 225A Gateway Boulevard, South San Francisco, CA 94080 (US).

(72) Inventors: **AFAR, Daniel, E., H.**; 435 Visitacion Avenue, Brisbane, CA 94005 (US). **AGUS, David**; 522 North Crescent Drive, Beverly Hills, CA 90210 (US). **MACK, David, H.**; 2076 Monterey Avenue, Menlo Park, CA 94025 (US).

(74) Agents: **BASTIAN, Kevin, L.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, Eighth Floor, San Francisco, CA 94111 (US).

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(54) **Title:** METHODS OF DIAGNOSIS AND TREATMENT OF ANDROGEN-DEPENDENT PROSTATE CANCER, PROSTATE CANCER UNDERGOING ANDROGEN-WITHDRAWAL, AND ANDROGEN-INDEPENDENT PROSTATE CANCER

(57) **Abstract:** Described herein are genes whose expression are up-regulated or down-regulated in prostate cancer. Also described are such genes whose expression is further up-regulated or down-regulated in drug-resistant prostate cancer cells. Related methods and compositions that can be used for diagnosis and treatment of prostate cancer are disclosed. Also described herein are methods that can be used to identify modulators of prostate cancer.

METHODS OF DIAGNOSIS AND TREATMENT OF ANDROGEN-DEPENDENT PROSTATE CANCER, PROSTATE CANCER UNDERGOING ANDROGEN WITHDRAWAL, AND ANDROGEN-INDEPENDENT PROSTATE CANCER

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority from the following applications: USSN 60/295,917, filed June 4, 2001, USSN 60/368,689, filed March 29, 2002; USSN 60/350,666, filed November 13, 2001; and USSN 60/372,246, filed April 12, 2002; each of which is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

The invention relates to the identification of nucleic acid and protein expression profiles and nucleic acids, products, and antibodies thereto that are involved in prostate cancer; and to the use of such expression profiles and compositions in the diagnosis, prognosis, and therapy of prostate cancer. The invention further relates to methods for identifying and using agents and/or targets that inhibit prostate cancer.

BACKGROUND OF THE INVENTION

Prostate cancer is the most frequently diagnosed cancer and the second leading cause of male cancer death in North America and northern Europe. Early detection of prostate cancer using a serum test for prostate-specific antigen (PSA) has dramatically improved the treatment of the disease (Oesterling (1992) J. Am. Med. Assoc. 267:2236-2238). Treatment of prostate cancer consists largely of surgical prostatectomy, radiation therapy, androgen ablation therapy and chemotherapy. Although many prostate cancer patients are effectively treated, the current therapies can all induce serious side effects which diminish quality of life. Patients who present with metastatic disease are most often treated with androgen-ablation therapy. Hormone blockade results in significant regression of the tumor. However, this treatment rarely cures the patient and invariably results in progression to androgen-

independent disease, which is incurable. Afrin and Stuart (1994) J.S.C. Med. Assoc. 90:231-236.

The identification of novel therapeutic targets and diagnostic markers is essential for improving the current treatment of prostate cancer patients. Recent advances in molecular medicine have increased the interest in tumor-specific cell surface antigens that could serve as targets for various immunotherapeutic or small molecule strategies. Antigens suitable for immunotherapeutic strategies should be highly expressed in cancer tissues and ideally not expressed in normal adult tissues. Expression in tissues that are dispensable for life, however, may be tolerated. Examples of such antigens include Her2/neu and the B-cell antigen CD20. Humanized monoclonal antibodies directed to Her2/neu (Herceptin) are currently in use for the treatment of metastatic breast cancer. Ross and Fletcher (1998) Stem Cells 16:413-428. Similarly, anti-CD20 monoclonal antibodies (Rituxin) are used to effectively treat non-Hodgkin's lymphoma. Maloney, et al. (1997) Blood 90:2188-2195; Leget and Czuczman (1998) Curr. Opin. Oncol. 10:548-551.

Several potential immunotherapeutic targets have been identified for prostate cancer. They include prostate-specific membrane antigen (PSMA) (Israeli, et al. (1993) Cancer Res. 53:227-230), prostate stem cell antigen (PSCA; Reiter, et al. (1998) Proc. Natl. Acad. Sci. USA 95:1735-1740), and serpentine transmembrane epithelial antigen of the prostate (STEAP; Hubert, et al. (1999) Proc. Natl. Acad. Sci. USA 96:14529-14534). PSMA is a type II transmembrane hydrolase with significant homology to a rat neuropeptidase (Carter, et al. (1996) Proc. Natl. Acad. Sci. USA 93:749-753). Antibodies directed towards PSMA are currently being used to detect metastasized prostate cancer as the Prostascint Scan (Sodee, et al. (1996) Clin. Nucl. Med. 21:759-767) and are also being evaluated for treatment of advanced disease (Gregorakis, et al. (1998) Semin. Urol. Oncol. 16:2-12; Liu, et al. (1998) Cancer Res. 58:4055-4060; Murphy, et al. (1998) J. Urol. 160:2396-2401). In a study on bone metastasis of prostate cancer, only 8 out of 18 patient samples expressed PSMA (Silver, et al. (1997) Clin. Cancer Res. 3:81-85). Therefore, it is clear that other targets need to be identified to manage metastasized disease. PSCA is a member of the Thy-1/Ly-6 family of glycosylphosphatidylinositol-linked plasma membrane proteins (Reiter, et al. (1998) Proc. Natl. Acad. Sci. USA 95:1735-1740). Immunohistochemical data shows that PSCA is up-regulated in the majority of prostate cancer epithelia and is also detected in bone metastasis (Gu, et al. (2000) Oncogene 19:1288-1296). Recent work shows that antibodies directed to

PSCA can prevent metastatic spread of prostate cancer in a mouse model (Saffran, et al. (2001) Proc. Natl. Acad. Sci. USA 98:2658-2663). STEAP is a multi-transmembrane prostate-specific protein that may function as a channel or transporter protein (Hubert, et al. (1999) Proc. Natl. Acad. Sci. USA 96:14529-14534). Its protein expression is specific to the basolateral membranes of normal prostate and prostate cancer epithelia. STEAP expression was most highly concentrated at cell-cell boundaries, implying a potential function in intercellular communication. Therapeutic monoclonal antibodies have so far not been reported for STEAP.

SUMMARY OF THE INVENTION

The present invention therefore provides nucleotide sequences of genes that are up- and down-regulated in androgen-independent prostate cancer cells or prostate cells undergoing androgen withdrawal. Such genes are useful for diagnostic purposes, and also as targets for screening for therapeutic compounds that modulate prostate cancer, such as hormones or antibodies. Other aspects of the invention will become apparent to the skilled artisan by the following description of the invention.

In one aspect, the present invention provides a method of detecting an androgen independent prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to nucleic acid molecule comprising a sequence at least 80% identical to a sequence as shown in Tables 1A-4.

In one embodiment, the present invention provides a method of determining the level of a prostate cancer associated transcript in a cell from a patient.

In one embodiment, the present invention provides a method of detecting a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4.

In various embodiments, the polynucleotide selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1A-4; the polynucleotide comprises a sequence as shown in Tables 1A-4; the biological sample is a tissue sample; the biological sample comprises isolated nucleic acids, e.g., mRNA; the polynucleotide is labeled, e.g., with a fluorescent label; the polynucleotide is immobilized on a solid surface; the patient is

undergoing a therapeutic regimen to treat prostate cancer; the patient is suspected of having metastatic prostate cancer; the patient is a human; the patient is suspected of having a taxol-resistant cancer; or the prostate cancer associated transcript is mRNA.

In other embodiments, the method further comprises the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide.

In another aspect, the present invention provides a method of monitoring the efficacy of a therapeutic treatment of prostate cancer, the method comprising the steps of: (i) providing a biological sample from a patient undergoing the therapeutic treatment; and (ii) determining the level of a prostate cancer-associated transcript in the biological sample by contacting the biological sample with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4, thereby monitoring the efficacy of the therapy. In a further embodiment, the patient has metastatic prostate cancer. In a further embodiment, the patient has a drug resistant (e.g., taxol resistant) form of prostate cancer.

In one embodiment, the method further comprises the step of: (iii) comparing the level of the prostate cancer-associated transcript to a level of the prostate cancer-associated transcript in a biological sample from the patient prior to, or earlier in, the therapeutic treatment.

Additionally, provided herein is a method of evaluating the effect of a candidate prostate cancer drug comprising administering the drug to a patient and removing a cell sample from the patient. The expression profile of the cell is then determined. This method may further comprise comparing the expression profile to an expression profile of a healthy individual. In a preferred embodiment, said expression profile includes a gene of Tables 1A-4.

In one aspect, the present invention provides an isolated nucleic acid molecule consisting of a polynucleotide sequence as shown in Tables 1A-4.

In one embodiment, an expression vector or cell comprises the isolated nucleic acid.

In one aspect, the present invention provides an isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1A-4.

In another aspect, the present invention provides an antibody that specifically binds to an isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1A-4.

In certain embodiments, the antibody is conjugated to an effector component, e.g., a fluorescent label, a radioisotope or a cytotoxic chemical; the antibody is an antibody fragment; or the antibody is humanized.

In one aspect, the present invention provides a method of detecting a prostate cancer cell in a biological sample from a patient, the method comprising contacting the biological sample with an antibody as described herein.

In another aspect, the present invention provides a method of detecting antibodies specific to prostate cancer in a patient, the method comprising contacting a biological sample from the patient with a polypeptide encoded by a nucleic acid comprising a sequence from Tables 1A-4.

In another aspect, the present invention provides a method for identifying a compound that modulates a prostate cancer-associated polypeptide, the method comprising the steps of: a) contacting the compound with a prostate cancer-associated polypeptide, the polypeptide encoded by a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4; and b) determining the functional effect of the compound upon the polypeptide.

In one embodiment, the functional effect is a physical effect, an enzymatic effect, or a chemical effect.

In one embodiment, the polypeptide is expressed in a eukaryotic host cell or cell membrane. In another embodiment, the polypeptide is recombinant.

In one embodiment, the functional effect is determined by measuring ligand binding to the polypeptide.

In another aspect, the present invention provides a method of inhibiting proliferation of a prostate cancer-associated cell to treat prostate cancer in a patient, the method comprising the step of administering to the subject a therapeutically effective amount of a compound identified as described herein.

In one embodiment, the compound is an antibody.

In another aspect, the present invention provides a drug screening assay comprising the steps of: a) administering a test compound to a mammal having prostate cancer or to a cell sample isolated therefrom; b) comparing the level of gene expression of a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4 in a treated cell or mammal with the level of gene expression of the

polynucleotide in a control cell sample or mammal, wherein a test compound that modulates the level of expression of the polynucleotide is a candidate for the treatment of prostate cancer.

In one embodiment, the control is a mammal with prostate cancer or a cell sample therefrom that has not been treated with the test compound. In another embodiment, the control is a normal cell or mammal.

In one embodiment, the test compound is administered in varying amounts or concentrations. In another embodiment, the test compound is administered for varying time periods. In another embodiment, the comparison can occur after addition or removal of the drug candidate.

In one embodiment, the levels of a plurality of polynucleotides that selectively hybridize to a sequence at least 80% identical to a sequence as shown in Tables 1A-4 are individually compared to their respective levels in a control cell sample or mammal. In a preferred embodiment the plurality of polynucleotides is from three to ten.

In another aspect, the present invention provides a method for treating a mammal having prostate cancer comprising administering a compound identified by the assay described herein.

In another aspect, the present invention provides a pharmaceutical composition for treating a mammal having prostate cancer, the composition comprising a compound identified by the assay described herein and a physiologically acceptable excipient.

In one aspect, the present invention provides a method of screening drug candidates by providing a cell expressing a gene that is up- and down-regulated as in a prostate cancer. In one embodiment, a gene is selected from Tables 1A-4. The method further includes adding a drug candidate to the cell and determining the effect of the drug candidate on the expression of the expression profile gene.

In one embodiment, the method of screening drug candidates includes comparing the level of expression in the absence of the drug candidate to the level of expression in the presence of the drug candidate, wherein the concentration of the drug candidate can vary when present, and wherein the comparison can occur after addition or removal of the drug candidate. In a preferred embodiment, the cell expresses at least two expression profile genes. The profile genes may show an increase or decrease.

Also provided is a method of evaluating the effect of a candidate prostate cancer drug comprising administering the drug to a transgenic animal expressing or over-expressing the prostate cancer modulatory protein, or an animal lacking the prostate cancer modulatory protein, for example as a result of a gene knockout.

Moreover, provided herein is a biochip comprising one or more nucleic acid segments of Tables 1A-4, wherein the biochip comprises fewer than 1000 nucleic acid probes. Preferably, at least two nucleic acid segments are included. More preferably, at least three nucleic acid segments are included.

Furthermore, a method of diagnosing a disorder associated with prostate cancer is provided. The method comprises determining the expression of a gene of Tables 1A-4, in a first tissue type of a first individual, and comparing the distribution to the expression of the gene from a second normal tissue type from the first individual or a second unaffected individual. A difference in the expression indicates that the first individual has a disorder associated with prostate cancer.

In a further embodiment, the biochip also includes a polynucleotide sequence of a gene that is not up- and down-regulated in prostate cancer.

In one embodiment a method for screening for a bioactive agent capable of interfering with the binding of a prostate cancer modulating protein (prostate cancer modulatory protein) or a fragment thereof and an antibody which binds to said prostate cancer modulatory protein or fragment thereof. In a preferred embodiment, the method comprises combining a prostate cancer modulatory protein or fragment thereof, a candidate bioactive agent and an antibody which binds to said prostate cancer modulatory protein or fragment thereof. The method further includes determining the binding of said prostate cancer modulatory protein or fragment thereof and said antibody. Wherein there is a change in binding, an agent is identified as an interfering agent. The interfering agent can be an agonist or an antagonist. Preferably, the agent inhibits prostate cancer.

Also provided herein are methods of eliciting an immune response in an individual. In one embodiment a method provided herein comprises administering to an individual a composition comprising a prostate cancer modulating protein, or a fragment thereof. In another embodiment, the protein is encoded by a nucleic acid selected from those of Tables 1A-4.

Further provided herein are compositions capable of eliciting an immune response in an individual. In one embodiment, a composition provided herein comprises a prostate cancer modulating protein, preferably encoded by a nucleic acid of Tables 1A-4, or a fragment thereof, and a pharmaceutically acceptable carrier. In another embodiment, said composition comprises a nucleic acid comprising a sequence encoding a prostate cancer modulating protein, preferably selected from the nucleic acids of Tables 1A-4and a pharmaceutically acceptable carrier.

Also provided are methods of neutralizing the effect of a prostate cancer protein, or a fragment thereof, comprising contacting an agent specific for said protein with said protein in an amount sufficient to effect neutralization. In another embodiment, the protein is encoded by a nucleic acid selected from those of Tables 1A-4. In another aspect of the invention, a method of treating an individual for prostate cancer is provided. In one embodiment, the method comprises administering to said individual an inhibitor of a prostate cancer modulating protein. In another embodiment, the method comprises administering to a patient having prostate cancer an antibody to a prostate cancer modulating protein conjugated to a therapeutic moiety. Such a therapeutic moiety can be a cytotoxic agent or a radioisotope.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with the objects outlined above, the present invention provides novel methods for diagnosis and evaluation of androgen-dependent prostate cells (malignant or non-malignant), prostate cells undergoing androgen withdrawal, and androgen-independent prostate cancer, as well as methods for treating androgen-dependent prostate cells (malignant or non-malignant), prostate cancer undergoing androgen withdrawal, and androgen-independent prostate cancer. The current Specification incorporates the text of USSN 09/976,858, filed October 12, 2001, USSN 60/295,917, filed June 4, 2001, USSN 60/368,689, filed March 29, 2002; USSN 60/350,666, filed November 13, 2001; and USSN 60/372,246, filed April 12, 2002.

Table 1A provides unigene cluster identification numbers for the nucleotide sequence of genes that exhibit increased or decreased expression in androgen-independent prostate cancer samples. Table 1A also provides an exemplar accession number that provides a nucleotide sequence that is part of the unigene cluster. The expression patterns of the genes of Table 1A can be broadly defined into the following categories:

Genes that are expressed early in the time course, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-hi pattern in table 1A). Genes that are expressed early in the time course, then drop off in expression, and do not express again with emergence of androgen-independence (hi-lo-lo pattern in 1A). Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-hi pattern in table 1A). Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-hi-hi pattern in table 1A). Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-hi-lo pattern in table 1A).

Tables 2A-C provide unigene cluster identification numbers for the nucleotide sequence of genes that exhibit increased or decreased expression in androgen-dependent prostate cancer, prostate cancer undergoing androgen withdrawal and androgen-independent prostate cancer. Tables 2A-C also provide an exemplar accession number that provides a nucleotide sequence that is part of the unigene cluster. The expression patterns of the genes of Tables 2A-C can be broadly defined into the following 6 categories:

Genes that are expressed early in the time course of androgen withdrawal, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-lo-hi pattern in Table 2A). Genes that are expressed early in the time course, then drop off in expression immediately after androgen-withdrawal, and do not express again with emergence of androgen-independence (hi-lo-lo-lo pattern in Table 2A). Genes that are expressed early in the time course, then drop off in expression after several days of androgen withdrawal, and do not express again with emergence of androgen-independence (hi-hi-lo-lo pattern in Table 2A). Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-lo-hi pattern in Table 2A). Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-lo-hi-hi pattern in Table 2A). Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-lo-hi-lo pattern in Table 2A).

Definitions

The term "androgen ablation therapy" refers to techniques for the removal or destruction of sources of male hormones, such as testosterone. These techniques include, for example, 1) surgical removal of the testicles, 2) medications such as gonadatropin releasing hormone analogs that inhibit testosterone production, or 3) anti-androgenic drugs that block androgen receptors.

The term "androgen-independent prostate cancer protein" or "androgen-independent prostate cancer polynucleotide" or "androgen-independent prostate cancer-associated transcript" refers to nucleic acid and polypeptide polymorphic variants, alleles, mutants, and interspecies homologues that: (1) have a nucleotide sequence that has greater than about 60% nucleotide sequence identity, 65%, 70%, 75%, 80%, 85%, 90%, preferably 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% or greater nucleotide sequence identity, preferably over a region of over a region of at least about 25, 50, 100, 200, 500, 1000, or more nucleotides, to a nucleotide sequence of or associated with a unigene cluster of Tables 1A-4; (2) bind to antibodies, e.g., polyclonal antibodies, raised against an immunogen comprising an amino acid sequence encoded by a nucleotide sequence of or associated with a unigene cluster of Tables 1A-4 and conservatively modified variants thereof; (3) specifically hybridize under stringent hybridization conditions to a nucleic acid sequence, or the complement thereof of Tables 1A-4 and conservatively modified variants thereof; or (4) have an amino acid sequence that has greater than about 60% amino acid sequence identity, 65%, 70%, 75%, 80%, 85%, 90%, preferably 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% or greater amino sequence identity, preferably over a region of over a region of at least about 25, 50, 100, 200, 500, 1000, or more amino acid, to an amino acid sequence encoded by a nucleotide sequence of or associated with a unigene cluster of Tables 1A-4. These polynucleotides or proteins may also be expressed during a period following androgen withdrawal. A polynucleotide or polypeptide sequence is typically from a mammal including, but not limited to, primate, e.g., human; rodent, e.g., rat, mouse, hamster; cow, pig, horse, sheep, or other mammal. A "prostate cancer polypeptide" and a "prostate cancer polynucleotide," include both naturally occurring or recombinant forms, and may refer to those polypeptides or polynucleotides which are expressed in prostate proliferative cells.

A "full length" prostate cancer protein or nucleic acid refers to a prostate cancer polypeptide or polynucleotide sequence, or a variant thereof, that contains the elements normally contained in one or more naturally occurring, wild type prostate cancer

polynucleotide or polypeptide sequences. The "full length" may be prior to, or after, various stages of post-translation processing or splicing, including alternative splicing.

"Biological sample" as used herein is a sample of biological tissue or fluid that contains nucleic acids or polypeptides, e.g., of a prostate cancer protein, polynucleotide or transcript. Such samples include, but are not limited to, tissue isolated from primates, e.g., humans, or rodents, e.g., mice, and rats. Biological samples may also include sections of tissues such as biopsy and autopsy samples, frozen sections taken for histology purposes, blood, plasma, serum, sputum, stool, tears, mucus, hair, skin, etc. Biological samples also include explants and primary and/or transformed cell cultures derived from patient tissues. A biological sample is typically obtained from a eukaryotic organism, most preferably a mammal such as a primate e.g., chimpanzee or human; cow; dog; cat; a rodent, e.g., guinea pig, rat, mouse; rabbit; or a bird; reptile; or fish.

"Providing a biological sample" means to obtain a biological sample for use in methods described in this invention. Most often, this will be done by removing a sample of cells from an animal, but can also be accomplished by using previously isolated cells (e.g., isolated by another person, at another time, and/or for another purpose), by collecting a sample which contains a soluble polypeptide or nucleic acid derived from a prostate cell, or by performing the methods of the invention in vivo. Archival tissues, having treatment or outcome history, will be particularly useful.

The terms "identical" or percent "identity," in the context of two or more nucleic acids or polypeptide sequences, refer to two or more sequences or subsequences that are the same or have a specified percentage of amino acid residues or nucleotides that are the same (i.e., about 60% identity, preferably 70%, 75%, 80%, 85%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99%, or higher identity over a specified region, when compared and aligned for maximum correspondence over a comparison window or designated region) as measured using a BLAST or BLAST 2.0 sequence comparison algorithms with default parameters described below, or by manual alignment and visual inspection (see, e.g., NCBI web site http://www.ncbi.nlm.nih.gov/BLAST/ or the like). Such sequences are then said to be "substantially identical." This definition also refers to, or may be applied to, the compliment of a test sequence. The definition also includes sequences that have deletions and/or additions, as well as those that have substitutions, as well as naturally occurring, e.g., polymorphic or allelic variants, and man-made variants. As described below, the preferred

algorithms can account for gaps and the like. Preferably, identity exists over a region that is at least about 25 amino acids or nucleotides in length, or more preferably over a region that is 50-100 amino acids or nucleotides in length.

For sequence comparison, typically one sequence acts as a reference sequence, to which test sequences are compared. When using a sequence comparison algorithm, test and reference sequences are entered into a computer, subsequence coordinates are designated, if necessary, and sequence algorithm program parameters are designated. Preferably, default program parameters can be used, or alternative parameters can be designated. The sequence comparison algorithm then calculates the percent sequence identities for the test sequences relative to the reference sequence, based on the program parameters.

A "comparison window", as used herein, includes reference to a segment of one of the number of contiguous positions selected from the group consisting typically of from 20 to 600, usually about 50 to about 200, more usually about 100 to about 150 in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned. Methods of alignment of sequences for comparison are well-known in the art. Optimal alignment of sequences for comparison can be conducted, e.g., by the local homology algorithm of Smith and Waterman (1981) Appl. Math. 2:482, by the homology alignment algorithm of Needleman and Wunsch (1970) J. Mol. Biol. 48:443-453, by the search for similarity method of Pearson and Lipman (1988) Proc. Nat'l. Acad. Sci. USA 85:2444-2448, by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, 575 Science Dr., Madison, WI), or by manual alignment and visual inspection (see, e.g., Ausubel, et al. (eds. 1995 and supplements) Current Protocols in Molecular Biology Lippincott).

Preferred examples of algorithms that are suitable for determining percent sequence identity and sequence similarity include the BLAST and BLAST 2.0 algorithms, which are described in Altschul, et al. (1977) Nuc. Acids Res. 25:3389-3402 and Altschul, et al. (1990) J. Mol. Biol. 215:403-410. BLAST and BLAST 2.0 are used, with the parameters described herein, to determine percent sequence identity for the nucleic acids and proteins of the invention. Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information (http://www.ncbi.nlm.nih.gov/). This algorithm involves first identifying high scoring sequence pairs (HSPs) by identifying short

words of length W in the query sequence, which either match or satisfy some positive-valued threshold score T when aligned with a word of the same length in a database sequence. T is referred to as the neighborhood word score threshold (Altschul, et al., supra). These initial neighborhood word hits act as seeds for initiating searches to find longer HSPs containing them. The word hits are extended in both directions along each sequence for as far as the cumulative alignment score can be increased. Cumulative scores are calculated using, e.g., for nucleotide sequences, the parameters M (reward score for a pair of matching residues; always > 0) and N (penalty score for mismatching residues; always < 0). For amino acid sequences, a scoring matrix is used to calculate the cumulative score. Extension of the word hits in each direction are halted when: the cumulative alignment score falls off by the quantity X from its maximum achieved value; the cumulative score goes to zero or below, due to the accumulation of one or more negative-scoring residue alignments; or the end of either sequence is reached. The BLAST algorithm parameters W, T, and X determine the sensitivity and speed of the alignment. The BLASTN program (for nucleotide sequences) uses as defaults a wordlength (W) of 11, an expectation (E) of 10, M=5, N=-4 and a comparison of both strands. For amino acid sequences, the BLASTP program uses as defaults a wordlength of 3, and expectation (E) of 10, and the BLOSUM62 scoring matrix (see Henikoff and Henikoff (1989) Proc. Natl. Acad. Sci. USA 89:10915-919) alignments (B) of 50, expectation (E) of 10, M=5, N=-4, and a comparison of both strands.

The BLAST algorithm also performs a statistical analysis of the similarity between two sequences (see, e.g., Karlin and Altschul (1993) Proc. Nat'l. Acad. Sci. USA 90:5873-5787). One measure of similarity provided by the BLAST algorithm is the smallest sum probability (P(N)), which provides an indication of the probability by which a match between two nucleotide or amino acid sequences would occur by chance. For example, a nucleic acid is considered similar to a reference sequence if the smallest sum probability in a comparison of the test nucleic acid to the reference nucleic acid is less than about 0.2, more preferably less than about 0.01, and most preferably less than about 0.001. Log values may be large negative numbers, e.g., 5, 10, 20, 30, 40, 40, 70, 90, 110, 150, 170, etc.

An indication that two nucleic acid sequences or polypeptides are substantially identical is that the polypeptide encoded by the first nucleic acid is immunologically cross reactive with the antibodies raised against the polypeptide encoded by the second nucleic acid, as described below. Thus, a polypeptide is typically substantially identical to a second

polypeptide, e.g., where the two peptides differ only by conservative substitutions. Another indication that two nucleic acid sequences are substantially identical is that the two molecules or their complements hybridize to each other under stringent conditions, as described below. Yet another indication that two nucleic acid sequences are substantially identical is that the same primers can be used to amplify the sequences.

A "host cell" is a naturally occurring cell or a transformed cell that contains an expression vector and supports the replication or expression of the expression vector. Host cells may be cultured cells, explants, cells in vivo, and the like. Host cells may be prokaryotic cells such as E. coli, or eukaryotic cells such as yeast, insect, amphibian, or mammalian cells such as CHO, HeLa, and the like (see, e.g., the American Type Culture Collection catalog or web site, www.atcc.org).

The terms "isolated," "purified," or "biologically pure" refer to material that is substantially or essentially free from components that normally accompany it as found in its native state. Purity and homogeneity are typically determined using analytical chemistry techniques such as polyacrylamide gel electrophoresis or high performance liquid chromatography. A protein or nucleic acid that is the predominant species present in a preparation is substantially purified. In particular, an isolated nucleic acid is separated from some open reading frames that naturally flank the gene and encode proteins other than protein encoded by the gene. The term "purified" in some embodiments denotes that a nucleic acid or protein gives rise to essentially one band in an electrophoretic gel. Preferably, it means that the nucleic acid or protein is at least 85% pure, more preferably at least 95% pure, and most preferably at least 99% pure. "Purify" or "purification" in other embodiments means removing at least one contaminant from the composition to be purified. In this sense, purification does not require that the purified compound be homogenous, e.g., 100% pure.

The terms "polypeptide," "peptide," and "protein" are used interchangeably herein to refer to a polymer of amino acid residues. The terms apply to amino acid polymers in which one or more amino acid residue is an artificial chemical mimetic of a corresponding naturally occurring amino acid, as well as to naturally occurring amino acid polymers, those containing modified residues, and non-naturally occurring amino acid polymer. Certain diagnostic methods may evaluate secreted or breakdown products present only because the producing cell is present, and would otherwise be absent in a normal individual.

The term "amino acid" refers to naturally occurring and synthetic amino acids, as well as amino acid analogs and amino acid mimetics that function similarly to the naturally occurring amino acids. Naturally occurring amino acids are those encoded by the genetic code, as well as those amino acids that are later modified, e.g., hydroxyproline, γ-carboxyglutamate, and O-phosphoserine. Amino acid analogs refers to compounds that have the same basic chemical structure as a naturally occurring amino acid, e.g., an α carbon that is bound to a hydrogen, a carboxyl group, an amino group, and an R group, e.g., homoserine, norleucine, methionine sulfoxide, methionine methyl sulfonium. Such analogs may have modified R groups (e.g., norleucine) or modified peptide backbones, but retain the same basic chemical structure as a naturally occurring amino acid. Amino acid mimetics refers to chemical compounds that have a structure that is different from the general chemical structure of an amino acid, but that functions similarly to a naturally occurring amino acid.

Amino acids may be referred to herein by either their commonly known three letter symbols or by the one-letter symbols recommended by the IUPAC-IUB Biochemical Nomenclature Commission. Nucleotides, likewise, may be referred to by their commonly accepted single-letter codes.

"Conservatively modified variants" applies to both amino acid and nucleic acid sequences. With respect to particular nucleic acid sequences, conservatively modified variants refers to those nucleic acids which encode identical or essentially identical amino acid sequences, or where the nucleic acid does not encode an amino acid sequence, to essentially identical or associated, e.g., naturally contiguous, sequences. Because of the degeneracy of the genetic code, a large number of functionally identical nucleic acids encode most proteins. For instance, the codons GCA, GCC, GCG, and GCU encode the amino acid alanine. Thus, at every position where an alanine is specified by a codon, the codon can be altered to another of the corresponding codons described without altering the encoded polypeptide. Such nucleic acid variations are "silent variations," which are one species of conservatively modified variations. Every nucleic acid sequence herein which encodes a polypeptide also describes silent variations of the nucleic acid. One of skill will recognize that in certain contexts each codon in a nucleic acid (except AUG, which is ordinarily the only codon for methionine, and TGG, which is ordinarily the only codon for tryptophan) can be modified to yield a functionally identical molecule. Accordingly, often silent variations of

a nucleic acid which encodes a polypeptide is implicit in a described sequence with respect to the expression product, but not with respect to actual probe sequences.

As to amino acid sequences, one of skill will recognize that individual substitutions, deletions or additions to a nucleic acid, peptide, polypeptide, or protein sequence which alters, adds or deletes a single amino acid or a small percentage of amino acids in the encoded sequence is a "conservatively modified variant" where the alteration results in the substitution of an amino acid with a chemically similar amino acid. Conservative substitutions providing functionally similar amino acids are well known in the art. Such conservatively modified variants are in addition to and do not exclude polymorphic variants, interspecies homologs, and alleles of the invention, typically conservative substitutions for one another: 1) Alanine (A), Glycine (G); 2) Aspartic acid (D), Glutamic acid (E); 3) Asparagine (N), Glutamine (Q); 4) Arginine (R), Lysine (K); 5) Isoleucine (I), Leucine (L), Methionine (M), Valine (V); 6) Phenylalanine (F), Tyrosine (Y), Tryptophan (W); 7) Serine (S), Threonine (T); and 8) Cysteine (C), Methionine (M) (see, e.g., Creighton (1984) Proteins Freeman).

Macromolecular structures such as polypeptide structures can be described in terms of various levels of organization. For a general discussion of this organization, see, e.g., Alberts, et al. (2001) Molecular Biology of the Cell (4th ed.) and Cantor and Schimmel (1980) Biophysical Chemistry Part I: The Conformation of Biological Macromolecules Freeman. "Primary structure" refers to the amino acid sequence of a particular peptide. "Secondary structure" refers to locally ordered, three dimensional structures within a polypeptide. These structures are commonly known as domains. Domains are portions of a polypeptide that often form a compact unit of the polypeptide and are typically 25 to approximately 500 amino acids long. Typical domains are made up of sections of lesser organization such as stretches of β-sheet and α-helices. "Tertiary structure" refers to the complete three dimensional structure of a polypeptide monomer. "Quaternary structure" refers to the three dimensional structure formed, usually by the noncovalent association of independent tertiary units. Anisotropic terms are also known as energy terms.

"Nucleic acid" or "oligonucleotide" or "polynucleotide" or grammatical equivalents used herein means at least two nucleotides covalently linked together. Oligonucleotides are typically from about 5, 6, 7, 8, 9, 10, 12, 15, 25, 30, 40, 50 or more nucleotides in length, up to about 100 nucleotides in length. Nucleic acids and polynucleotides are a polymers of virtually any length, including longer lengths, e.g., 200, 300, 500, 1000, 2000, 3000, 5000,

7000, 10,000, etc. A nucleic acid of the present invention will generally contain phosphodiester bonds, although in some cases, nucleic acid analogs are included that may have alternate backbones, comprising, e.g., phosphoramidate, phosphorothioate, phosphorodithioate, or O-methylphosphoroamidite linkages (see Eckstein (1992) Oligonucleotides and Analogues: A Practical Approach, Oxford University Press); and peptide nucleic acid backbones and linkages. Other analog nucleic acids include those with positive backbones; non-ionic backbones, and non-ribose backbones, including those described in U.S. Patent Nos. 5,235,033 and 5,034,506, and Chapters 6 and 7, ASC Symposium Series 580, Sanghvi and Cook (eds. 1994) Carbohydrate Modifications in Antisense Research ACS Symposium Series 580. Nucleic acids containing one or more carbocyclic sugars are also included within one definition of nucleic acids. Modifications of the ribose-phosphate backbone may be done for a variety of reasons, e.g., to increase the stability and half-life of such molecules in physiological environments or as probes on a biochip. Mixtures of naturally occurring nucleic acids and analogs can be made; alternatively, mixtures of different nucleic acid analogs, and mixtures of naturally occurring nucleic acids and analogs may be made.

A variety of references disclose such nucleic acid analogs, including, for example, phosphoramidate (Beaucage, et al. (1993) Tetrahedron 49(10):1925-1963 and references therein; Letsinger (1970) J. Org. Chem. 35:3800-3803; Sprinzl, et al. (1977) Eur. J. Biochem. 81:579-589; Letsinger, et al. (1986) Nucl. Acids Res. 14:3487-499; Sawai, et al (1984) Chem. Lett. 805, Letsinger, et al. (1988) J. Am. Chem. Soc. 110:4470-4471; and Pauwels, et al. (1986) Chemica Scripta 26:141-149), phosphorothioate (Mag, et al. (1991) Nucleic Acids Res. 19:1437-441; and U.S. Patent No. 5,644,048), phosphorodithioate (Briu, et al. (1989) J. Am. Chem. Soc. 111:2321-xxx, O-methylphosphoroamidite linkages (see Eckstein (1992) Oligonucleotides and Analogues: A Practical Approach Oxford University Press), and peptide nucleic acid backbones and linkages (see Egholm (1992) J. Am. Chem. Soc. 114:1895-1897; Meier, et al. (1992) Chem. Int. Ed. Engl. 31:1008-1010; Nielsen (1993) Nature 365:566-568; Carlsson, et al. (1996) Nature 380:207, each of which is incorporated by reference). Other analog nucleic acids include those with positive backbones (Denpcy, et al. (1995) Proc. Natl. Acad. Sci. USA 92:6097-101; non-ionic backbones (U.S. Patent Nos. 5,386,023, 5,637,684, 5,602,240, 5,216,141 and 4,469,863; Kiedrowshi, et al. (1991) Angew. Chem. Intl. Ed. English 30:423-426; Letsinger, et al. (1988) J. Am. Chem. Soc. 110:4470;

Letsinger, et al. (1994) Nucleoside and Nucleotide 13:1597-xxx; Chapters 2 and 3 in Sanghvi and Cook (eds. 1994) Carbohydrate Modifications in Antisense Research ACS Symposium Series 580; Mesmaeker, et al. (1994) Bioorganic and Medicinal Chem. Lett. 4:395-xxx; Jeffs, et al. (1994) J. Biomolecular NMR 34:17; Horn (1996) Tetrahedron Lett. 37:743-xxx) and non-ribose backbones, including those described in U.S. Patent Nos. 5,235,033 and 5,034,506, and Chapters 6 and 7 in Sanghvi and Cook (eds. 1994) Carbohydrate Modifications in Antisense Research ACS Symposium Series 580. Nucleic acids containing one or more carbocyclic sugars are also included within one definition of nucleic acids (see Jenkins, et al. (1995) Chem. Soc. Rev. xx:169-176). Several nucleic acid analogs are described in Rawls (p. 35, June 2, 1997) C&E News. Each of these references is hereby expressly incorporated by reference.

Particularly preferred are peptide nucleic acids (PNA) which includes peptide nucleic acid analogs. These backbones are substantially non-ionic under neutral conditions, in contrast to the highly charged phosphodiester backbone of naturally occurring nucleic acids. This results in two advantages. First, the PNA backbone exhibits improved hybridization kinetics. PNAs have larger changes in the melting temperature (T_m) for mismatched versus perfectly matched base pairs. DNA and RNA typically exhibit a 2-4° C drop in T_m for an internal mismatch. With the non-ionic PNA backbone, the drop is closer to 7-9° C. Similarly, due to their non-ionic nature, hybridization of the bases attached to these backbones is relatively insensitive to salt concentration. In addition, PNAs are not degraded by cellular enzymes, and thus can be more stable.

The nucleic acids may be single stranded or double stranded, as specified, or contain portions of both double stranded or single stranded sequence. As will be appreciated by those in the art, the depiction of a single strand also defines the sequence of the complementary strand; thus the sequences described herein also provide the complement of the sequence. The nucleic acid may be DNA, both genomic and cDNA, RNA or a hybrid, where the nucleic acid may contain combinations of deoxyribo- and ribo-nucleotides, and combinations of bases, including uracil, adenine, thymine, cytosine, guanine, inosine, xanthine hypoxanthine, isocytosine, isoguanine, etc. "Transcript" typically refers to a naturally occurring RNA, e.g., a pre-mRNA, hnRNA, or mRNA. As used herein, the term "nucleoside" includes nucleotides and nucleoside and nucleotide analogs, and modified nucleosides such as amino modified nucleosides. In addition, "nucleoside" includes non-naturally occurring analog structures.

Thus, e.g., the individual units of a peptide nucleic acid, each containing a base, are referred to herein as a nucleoside.

A "label" or a "detectable moiety" is a composition detectable by spectroscopic, photochemical, biochemical, immunochemical, chemical, or other physical means. For example, useful labels include ^{32}P, fluorescent dyes, electron-dense reagents, enzymes (e.g., as commonly used in an ELISA), biotin, digoxigenin, or haptens and proteins or other entities which can be made detectable, e.g., by incorporating a radiolabel into the peptide or used to detect antibodies specifically reactive with the peptide. The labels may be incorporated into the prostate cancer nucleic acids, proteins, and antibodies at virtually any position. Many methods for conjugating the antibody to the label may be employed, including those methods described by Hunter, et al. (1962) Nature, 144:945; David, et al. (1974) Biochemistry 13:1014-1021; Pain, et al. (1981) J. Immunol. Meth. 40:219-230; and Nygren (1982) J. Histochem. and Cytochem. 30:407-412.

An "effector" or "effector moiety" or "effector component" is a molecule that is bound (or linked, or conjugated), either covalently, through a linker or a chemical bond, or noncovalently, through ionic, van der Waals, electrostatic, or hydrogen bonds, to an antibody. The "effector" can be a variety of molecules including, e.g., detection moieties including radioactive compounds, fluorescent compounds, an enzyme or substrate, tags such as epitope tags, a toxin; activatable moieties, a chemotherapeutic agent; a lipase; an antibiotic; or a radioisotope emitting "hard" e.g., beta radiation.

A "labeled nucleic acid probe or oligonucleotide" is one that is bound, either covalently, through a linker or a chemical bond, or noncovalently, through ionic, van der Waals, electrostatic, or hydrogen bonds to a label such that the presence of the probe may be detected by detecting the presence of the label bound to the probe. Alternatively, method using high affinity interactions may achieve the same results where one of a pair of binding partners binds to the other, e.g., biotin, streptavidin.

As used herein a "nucleic acid probe or oligonucleotide" is defined as a nucleic acid capable of binding to a target nucleic acid of complementary sequence through one or more types of chemical bonds, usually through complementary base pairing, usually through hydrogen bond formation. As used herein, a probe may include natural (i.e., A, G, C, or T) or modified bases (7-deazaguanosine, inosine, etc.). In addition, the bases in a probe may be joined by a linkage other than a phosphodiester bond, so long as it does not functionally

interfere with hybridization. Thus, e.g., probes may be peptide nucleic acids in which the constituent bases are joined by peptide bonds rather than phosphodiester linkages. It will be understood by one of skill in the art that probes may bind target sequences lacking complete complementarity with the probe sequence depending upon the stringency of the hybridization conditions. The probes are preferably directly labeled as with isotopes, chromophores, lumiphores, chromogens, or indirectly labeled such as with biotin to which a streptavidin complex may later bind. By assaying for the presence or absence of the probe, one can detect the presence or absence of the select sequence or subsequence. Diagnosis or prognosis may be based at the genomic level, or at the level of RNA or protein expression.

The term "recombinant" when used with reference, e.g., to a cell, or nucleic acid, protein, or vector, indicates that the cell, nucleic acid, protein or vector, has been modified by the introduction of a heterologous nucleic acid or protein or the alteration of a native nucleic acid or protein, or that the cell is derived from a cell so modified. Thus, e.g., recombinant cells express genes that are not found within the native (non-recombinant) form of the cell or express native genes that are otherwise abnormally expressed, under expressed or not expressed at all. By the term "recombinant nucleic acid" herein is meant nucleic acid, originally formed in vitro, in general, by the manipulation of nucleic acid, e.g., using polymerases and endonucleases, in a form not normally found in nature. In this manner, operably linkage of different sequences is achieved. Thus an isolated nucleic acid, in a linear form, or an expression vector formed in vitro by ligating DNA molecules that are not normally joined, are both considered recombinant for the purposes of this invention. It is understood that once a recombinant nucleic acid is made and reintroduced into a host cell or organism, it will replicate non-recombinantly, i.e., using the in vivo cellular machinery of the host cell rather than in vitro manipulations; however, such nucleic acids, once produced recombinantly, although subsequently replicated non-recombinantly, are still considered recombinant for the purposes of the invention. Similarly, a "recombinant protein" is a protein made using recombinant techniques, i.e., through the expression of a recombinant nucleic acid as depicted above.

The term "heterologous" when used with reference to portions of a nucleic acid indicates that the nucleic acid comprises two or more subsequences that are not normally found in the same relationship to each other in nature. For instance, the nucleic acid is typically recombinantly produced, having two or more sequences, e.g., from unrelated genes

arranged to make a new functional nucleic acid, e.g., a promoter from one source and a coding region from another source. Similarly, a heterologous protein will often refer to two or more subsequences that are not found in the same relationship to each other in nature (e.g., a fusion protein).

A "promoter" is defined as an array of nucleic acid control sequences that direct transcription of a nucleic acid. As used herein, a promoter includes necessary nucleic acid sequences near the start site of transcription, such as, in the case of a polymerase II type promoter, a TATA element. A promoter also optionally includes distal enhancer or repressor elements, which can be located as much as several thousand base pairs from the start site of transcription. A "constitutive" promoter is a promoter that is active under most environmental and developmental conditions. An "inducible" promoter is a promoter that is active under environmental or developmental regulation. The term "operably linked" refers to a functional linkage between a nucleic acid expression control sequence (such as a promoter, or array of transcription factor binding sites) and a second nucleic acid sequence, wherein the expression control sequence directs transcription of the nucleic acid corresponding to the second sequence.

An "expression vector" is a nucleic acid construct, generated recombinantly or synthetically, with a series of specified nucleic acid elements that permit transcription of a particular nucleic acid in a host cell. The expression vector can be part of a plasmid, virus, or nucleic acid fragment. Typically, the expression vector includes a nucleic acid to be transcribed operably linked to a promoter.

The phrase "selectively (or specifically) hybridizes to" refers to the binding, duplexing, or hybridizing of a molecule only to a particular nucleotide sequence under stringent hybridization conditions when that sequence is present in a complex mixture (e.g., total cellular or library DNA or RNA).

The phrase "stringent hybridization conditions" refers to conditions under which a probe will hybridize to its target subsequence, typically in a complex mixture of nucleic acids, but to no other sequences. Stringent conditions are sequence-dependent and will be different in different circumstances. Longer sequences hybridize specifically at higher temperatures. An extensive guide to the hybridization of nucleic acids is found "Overview of principles of hybridization and the strategy of nucleic acid assays" in Tijssen (1993) Hybridization with Nucleic Probes (Techniques in Biochemistry and Molecular Biology vol.

24) Elsevier. Generally, stringent conditions are selected to be about 5-10° C lower than the thermal melting point (T_m) for the specific sequence at a defined ionic strength pH. The T_m is the temperature (under defined ionic strength, pH, and nucleic concentration) at which 50% of the probes complementary to the target hybridize to the target sequence at equilibrium (as the target sequences are present in excess, at T_m, 50% of the probes are occupied at equilibrium). Stringent conditions will be those in which the salt concentration is less than about 1.0 M sodium ion, typically about 0.01 to 1.0 M sodium ion concentration (or other salts) at pH 7.0 to 8.3 and the temperature is at least about 30° C for short probes (e.g., 10 to 50 nucleotides) and at least about 60° C for long probes (e.g., greater than 50 nucleotides). Stringent conditions may also be achieved with the addition of destabilizing agents such as formamide. For selective or specific hybridization, a positive signal is at least two times background, preferably 10 times background hybridization. Exemplary stringent hybridization conditions can be as following: 50% formamide, 5x SSC, and 1% SDS, incubating at 42° C, or, 5x SSC, 1% SDS, incubating at 65° C, with wash in 0.2x SSC, and 0.1% SDS at 65° C. For PCR, a temperature of about 36° C is typical for low stringency amplification, although annealing temperatures may vary between about 32° C and 48° C depending on primer length. For high stringency PCR amplification, a temperature of about 62° C is typical, although high stringency annealing temperatures can range from about 50-65° C, depending on the primer length and specificity. Typical cycle conditions for both high and low stringency amplifications include a denaturation phase of 90-95° C for 30-120 sec, an annealing phase lasting 30-120 sec, and an extension phase of about 72° C for 1-2 min. Protocols and guidelines for low and high stringency amplification reactions are provided, e.g., in Innis, et al. (1990) PCR Protocols: A Guide to Methods and Applications Academic Press, N.Y.

Nucleic acids that do not hybridize to each other under stringent conditions are still substantially identical if the polypeptides which they encode are substantially identical. This occurs, e.g., when a copy of a nucleic acid is created using the maximum codon degeneracy permitted by the genetic code. In such cases, the nucleic acids typically hybridize under moderately stringent hybridization conditions. Exemplary "moderately stringent hybridization conditions" include a hybridization in a buffer of 40% formamide, 1 M NaCl, 1% SDS at 37° C, and a wash in 1X SSC at 45° C. A positive hybridization is at least twice

background. Those of ordinary skill will readily recognize that alternative hybridization and wash conditions can be utilized to provide conditions of similar stringency. Additional guidelines for determining hybridization parameters are provided in numerous references, e.g., Ausubel, et al. (eds. 1991 and supplements) Current Protocols in Molecular Biology

The phrase "functional effects" in the context of assays for testing compounds that modulate activity of a prostate cancer protein includes the determination of a parameter that is indirectly or directly under the influence of the prostate cancer protein or nucleic acid, e.g., a functional, physical, or chemical effect, such as the ability to decrease prostate proliferation (malignant or non-malignant). It includes ligand binding activity; cell growth on soft agar; anchorage dependence; contact inhibition and density limitation of growth; cellular proliferation; cellular transformation; growth factor or serum dependence; tumor specific marker levels; invasiveness into Matrigel; tumor growth and metastasis in vivo; mRNA and protein expression in cells undergoing metastasis, and other characteristics of prostate cancer cells. "Functional effects" include in vitro, in vivo, and ex vivo activities.

By "determining the functional effect" is meant assaying for a compound that increases or decreases a parameter that is indirectly or directly under the influence of a prostate cancer protein sequence, e.g., functional, enzymatic, physical and chemical effects. Such functional effects can be measured by means known to those skilled in the art, e.g., changes in spectroscopic characteristics (e.g., fluorescence, absorbance, refractive index), hydrodynamic (e.g., shape), chromatographic, or solubility properties for the protein, measuring inducible markers or transcriptional activation of the prostate cancer protein; measuring binding activity or binding assays, e.g., binding to antibodies or other ligands, and measuring cellular proliferation. Determination of the functional effect of a compound on prostate cancer can also be performed using prostate cancer assays known to those of skill in the art such as an in vitro assays, e.g., cell growth on soft agar; anchorage dependence; contact inhibition and density limitation of growth; cellular proliferation; cellular transformation; growth factor or serum dependence; tumor specific marker levels; invasiveness into Matrigel; tumor growth and metastasis in vivo; mRNA and protein expression in cells undergoing metastasis, and other characteristics of prostate cancer cells. The functional effects can be evaluated by many means known to those skilled in the art, e.g., microscopy for quantitative or qualitative measures of alterations in morphological features, measurement of changes in RNA or protein levels for prostate cancer-associated sequences,

measurement of RNA stability, identification of downstream or reporter gene expression (CAT, luciferase, β-gal, GFP, and the like), e.g., via chemiluminescence, fluorescence, colorimetric reactions, antibody binding, inducible markers, and ligand binding assays.

"Inhibitors", "activators", and "modulators" of prostate cancer polynucleotide and polypeptide sequences are used to refer to activating, inhibitory, or modulating molecules or compounds identified using in vitro and in vivo assays of prostate cancer polynucleotide and polypeptide sequences. Inhibitors are compounds that, e.g., bind to, partially or totally block activity, decrease, prevent, delay activation, inactivate, desensitize, or down regulate the activity or expression of prostate cancer proteins, e.g., antagonists. Antisense nucleic acids may seem to inhibit expression and subsequent function of the protein. "Activators" are compounds that increase, open, activate, facilitate, enhance activation, sensitize, agonize, or up regulate prostate cancer protein activity. Inhibitors, activators, or modulators also include genetically modified versions of prostate cancer proteins, e.g., versions with altered activity, as well as naturally occurring and synthetic ligands, antagonists, agonists, antibodies, small chemical molecules and the like. Such assays for inhibitors and activators include, e.g., expressing the prostate cancer protein in vitro, in cells, or cell membranes, applying putative modulator compounds, and then determining the functional effects on activity, as described above. Activators and inhibitors of prostate cancer can also be identified by incubating prostate cancer cells with the test compound and determining increases or decreases in the expression of 1 or more prostate cancer proteins, e.g., 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 50 or more prostate cancer proteins, such as prostate cancer proteins encoded by the sequences set out in Tables 1A-4.

Samples or assays comprising prostate cancer proteins that are treated with a potential activator, inhibitor, or modulator are compared to control samples without the inhibitor, activator, or modulator to examine the extent of inhibition. Control samples (untreated with inhibitors) are assigned a relative protein activity value of 100%. Inhibition of a polypeptide is achieved when the activity value relative to the control is about 80%, preferably 50%, more preferably 25-0%. Activation of a prostate cancer polypeptide is achieved when the activity value relative to the control (untreated with activators) is 110%, more preferably 150%, more preferably 200-500% (i.e., two to five fold higher relative to the control), more preferably 1000-3000% higher.

The phrase "changes in cell growth" refers to a change in cell growth and proliferation characteristics in vitro or in vivo, such as cell viability, formation of foci, anchorage independence, semi-solid or soft agar growth, changes in contact inhibition and density limitation of growth, loss of growth factor or serum requirements, changes in cell morphology, gaining or losing immortalization, gaining or losing tumor specific markers, ability to form or suppress tumors when injected into suitable animal hosts, and/or immortalization of the cell. See, e.g., pp. 231-241 in Freshney (1994) Culture of Animal Cells: A Manual of Basic Technique (3d ed.) Wiley-Liss.

"Tumor cell" refers to precancerous, cancerous, and/or normal cells in a tumor.

"Cancer cells," "transformed" cells, or "transformation" in tissue culture, refers to spontaneous or induced phenotypic changes that do not necessarily involve the uptake of new genetic material. Although transformation can arise from infection with a transforming virus and incorporation of new genomic DNA, or uptake of exogenous DNA, it can also arise spontaneously or following exposure to a carcinogen, thereby mutating an endogenous gene. Transformation is associated with phenotypic changes, such as immortalization of cells, aberrant growth control, nonmorphological changes, and/or malignancy. See, Freshney (2001) Culture of Animal Cells: A Manual of Basic Technique (4th ed.) Wiley-Liss.

"Antibody" refers to a polypeptide comprising a framework region from an immunoglobulin gene or fragments thereof that specifically binds and recognizes an antigen. The recognized immunoglobulin genes include the kappa, lambda, alpha, gamma, delta, epsilon, and mu constant region genes, as well as the myriad immunoglobulin variable region genes. Light chains are classified as either kappa or lambda. Heavy chains are classified as gamma, mu, alpha, delta, or epsilon, which in turn define the immunoglobulin classes, IgG, IgM, IgA, IgD, and IgE, respectively. Typically, the antigen-binding region of an antibody or its functional equivalent will be most critical in specificity and affinity of binding. See Paul (ed. 1999) Fundamental Immunology (4th ed.) Raven.

An exemplary immunoglobulin (antibody) structural unit comprises a tetramer. Each tetramer is composed of two identical pairs of polypeptide chains, each pair having one "light" (about 25 kD) and one "heavy" chain (about 50-70 kD). The N-terminus of each chain defines a variable region of about 100 to 110 or more amino acids primarily responsible for antigen recognition. The terms variable light chain (V_L) and variable heavy chain (V_H) refer to these light and heavy chains respectively.

Antibodies exist, e.g., as intact immunoglobulins or as a number of well-characterized fragments produced by digestion with various peptidases. Thus, e.g., pepsin digests an antibody below the disulfide linkages in the hinge region to produce $F(ab)'_2$, a dimer of Fab which itself is a light chain joined to V_H-C_H1 by a disulfide bond. The $F(ab)'_2$ may be reduced under mild conditions to break the disulfide linkage in the hinge region, thereby converting the $F(ab)'_2$ dimer into an Fab' monomer. The Fab' monomer is essentially Fab with part of the hinge region (see Paul (ed. 1993) Fundamental Immunology (3d ed.) Raven. While various antibody fragments are defined in terms of the digestion of an intact antibody, one of skill will appreciate that such fragments may be synthesized de novo either chemically or by using recombinant DNA methodology. Thus, the term antibody, as used herein, also includes antibody fragments either produced by the modification of whole antibodies, or those synthesized de novo using recombinant DNA methodologies (e.g., single chain Fv) or those identified using phage display libraries (see, e.g., McCafferty, et al.(1990) Nature 348:552-554.

For preparation of antibodies, e.g., recombinant, monoclonal, or polyclonal antibodies, many technique known in the art can be used (see, e.g., Kohler and Milstein (1975) Nature 256:495-497; Kozbor, et al. (1983) Immunology Today 4:72; pp. 77-96 in Cole, et al. (1985) Monoclonal Antibodies and Cancer Therapy Liss; Coligan (1991) Current Protocols in Immunology Lippincott; Harlow and Lane (1988) Antibodies: A Laboratory Manual CSH Press; and Goding (1986) Monoclonal Antibodies: Principles and Practice (2d ed.) Academic Press. Techniques for the production of single chain antibodies (U.S. Patent 4,946,778) can be adapted to produce antibodies to polypeptides of this invention. Also, transgenic mice, or other organisms such as other mammals, may be used to express humanized antibodies. Alternatively, phage display technology can be used to identify antibodies and heteromeric Fab fragments that specifically bind to selected antigens (see, e.g., McCafferty, et al. (1990) Nature 348:552-554; Marks, et al. (1992) Biotechnology 10:779-783).

A "chimeric antibody" is an antibody molecule in which (a) the constant region, or a portion thereof, is altered, replaced or exchanged so that the antigen binding site (variable region) is linked to a constant region of a different or altered class, effector function and/or species, or an entirely different molecule which confers new properties to the chimeric antibody, e.g., an enzyme, toxin, hormone, growth factor, drug, etc.; or (b) the variable

region, or a portion thereof, is altered, replaced or exchanged with a variable region having a different or altered antigen specificity.

Identification of prostate cancer-associated sequences

In one aspect, the expression levels of genes are determined in different patient samples for which diagnosis information is desired, to provide expression profiles. An expression profile of a particular sample is essentially a "fingerprint" of the state of the sample; while two states may have a particular gene similarly expressed, the evaluation of a number of genes simultaneously allows the generation of a gene expression profile that is characteristic of the state of the cell. That is, normal tissue (e.g., normal prostate or other tissue) may be distinguished from pathological prostate cells, e.g., cancerous or metastatic cancerous tissue of the prostate, or prostate cancer tissue or metastatic prostate cancerous tissue can be compared with tissue samples of prostate and other tissues from surviving cancer patients. By comparing expression profiles of tissue in known different prostate cancer states, information regarding which genes are important (including both up- and down-regulation of genes) in each of these states is obtained.

The identification of sequences that are differentially expressed in prostate cancer versus non-prostate cancer tissue allows the use of this information in a number of ways. For example, a particular treatment regime may be evaluated: does a chemotherapeutic drug act to down-regulate prostate cancer or other proliferative disorders, and thus tumor growth or recurrence, in a particular patient. Alternatively, a treatment step may induce other markers which may be used as targets to destroy tumor cells. Similarly, diagnosis and treatment outcomes may be done or confirmed by comparing patient samples with the known expression profiles. Maliganant disease may be compared to non-malignant conditions. Metastatic tissue can also be analyzed to determine the stage of prostate cancer in the tissue, or origin of primary tumor, e.g., metastasis from a remote primary site. Furthermore, these gene expression profiles (or individual genes) allow screening of drug candidates with an eye to mimicking or altering a particular expression profile; e.g., screening can be done for drugs that suppress the prostate cancer expression profile. This may be done by making biochips comprising sets of the important prostate cancer genes, which can then be used in these screens. These methods can also be done on the protein basis; that is, protein expression levels of the prostate cancer proteins can be evaluated for diagnostic purposes or to screen

candidate agents. In addition, the prostate cancer nucleic acid sequences can be administered for gene therapy purposes, including the administration of antisense nucleic acids, or the prostate cancer proteins (including antibodies and other modulators thereof) administered as therapeutic drugs.

Thus the present invention provides nucleic acid and protein sequences that are differentially expressed in prostate cancer relative to normal tissues and/or non-malignant disease, or in different types of related diseases, herein termed "prostate cancer sequences." As outlined below, prostate cancer sequences include those that are up-regulated (i.e., expressed at a higher level) in prostate cancer, as well as those that are down-regulated (i.e., expressed at a lower level). In a preferred embodiment, the prostate cancer sequences are from humans; however, as will be appreciated by those in the art, prostate cancer sequences from other organisms may be useful in animal models of disease and drug evaluation; thus, other prostate cancer sequences are provided, from vertebrates, including mammals, including rodents (rats, mice, hamsters, guinea pigs, etc.), primates, farm animals (including sheep, goats, pigs, cows, horses, etc.) and pets, e.g., (dogs, cats, etc.). Prostate cancer sequences from other organisms may be obtained using the techniques outlined below.

Prostate cancer sequences can include both nucleic acid and amino acid sequences. As will be appreciated by those in the art and is more fully outlined below, prostate cancer nucleic acid sequences are useful in a variety of applications, including diagnostic applications, which will detect naturally occurring nucleic acids, as well as screening applications; e.g., biochips comprising nucleic acid probes or PCR microtiter plates with selected probes to the prostate cancer sequences can be generated.

A prostate cancer sequence can be initially identified by substantial nucleic acid and/or amino acid sequence homology to the prostate cancer sequences outlined herein. Such homology can be based upon the overall nucleic acid or amino acid sequence, and is generally determined as outlined below, using either homology programs or hybridization conditions.

For identifying prostate cancer-associated sequences, the prostate cancer screen typically includes comparing genes identified in different tissues, e.g., normal and cancerous tissues, or tumor tissue samples from patients who have metastatic disease vs. non metastatic tissue. Other suitable tissue comparisons include comparing prostate cancer samples with metastatic cancer samples from other cancers, such as lung, breast, gastrointestinal cancers,

ovarian, etc. Samples of different stages of prostate cancer, e.g., survivor tissue, drug resistant states, and tissue undergoing metastasis, are applied to biochips comprising nucleic acid probes. The samples are first microdissected, if applicable, and treated as is known in the art for the preparation of mRNA. Suitable biochips are commercially available, e.g., from Affymetrix. Gene expression profiles are generated and the data analyzed.

In one embodiment, the genes showing changes in expression as between normal and disease states are compared to genes expressed in other normal tissues, preferably normal prostate, but also including, and not limited to lung, heart, brain, liver, breast, kidney, muscle, colon, small intestine, large intestine, spleen, bone, and placenta. In a preferred embodiment, those genes identified during the prostate cancer screen that are expressed in a significant amount in other tissues are removed from the profile, although in some embodiments, this is not necessary. That is, when screening for drugs, it is usually preferable that the target be disease specific, to minimize possible side effects on other organs were there expression.

In a preferred embodiment, prostate cancer sequences are those that are up-regulated in prostate cancer or related conditions; that is, the expression of these genes is higher in the prostate cancer tissue as compared to non-cancerous tissue. "Up-regulation" as used herein often means at least about a two-fold change, preferably at least about a three fold change, with at least about five-fold or higher being preferred. Another embodiment is directed to sequences up-regulated in non-malignant conditions relative to normal.

Unigene cluster identification numbers and accession numbers herein are for the GenBank sequence database and the sequences of the accession numbers are hereby expressly incorporated by reference. GenBank is known in the art, see, e.g., Benson, et al. (1998) Nucleic Acids Research 26:1-7 and http://www.ncbi.nlm.nih.gov/. Sequences are also available in other databases, e.g., European Molecular Biology Laboratory (EMBL) and DNA Database of Japan (DDBJ). U.S. Patent Application N. 09/687,576 and 09/976,858 (-001-3) further disclose related sequences, compositions, and methods of diagnosis and treatment of prostate cancer and related conditions and are hereby expressly incorporated by reference.

In another preferred embodiment, prostate cancer sequences are those that are down-regulated in the prostate cancer; that is, the expression of these genes is lower in prostate cancer tissue as compared to non-cancerous tissue. "Down-regulation" as used herein often

means at least about a two-fold change, preferably at least about a three fold change, with at least about five-fold or higher being preferred.

Informatics

The ability to identify genes that are over or under expressed in prostate cancer can additionally provide high-resolution, high-sensitivity datasets which can be used in the areas of diagnostics, therapeutics, drug development, pharmacogenetics, protein structure, biosensor development, and other related areas. For example, the expression profiles can be used in diagnostic or prognostic evaluation of patients with prostate cancer. Or as another example, subcellular toxicological information can be generated to better direct drug structure and activity correlation (see Anderson, Pharmaceutical Proteomics: Targets, Mechanism, and Function, paper presented at the IBC Proteomics conference, Coronado, CA (June 11-12, 1998)). Subcellular toxicological information can also be utilized in a biological sensor device to predict the likely toxicological effect of chemical exposures and likely tolerable exposure thresholds (see U.S. Patent No. 5,811,231). Similar advantages accrue from datasets relevant to other biomolecules and bioactive agents (e.g., nucleic acids, saccharides, lipids, drugs, and the like).

Thus, in another embodiment, the present invention provides a database that includes at least one set of assay data. The data contained in the database is acquired, e.g., using array analysis either singly or in a library format. The database can be in a form in which data can be maintained and transmitted, but is preferably an electronic database. The electronic database of the invention can be maintained on an electronic device allowing for the storage of and access to the database, such as a personal computer, but is preferably distributed on a wide area network, such as the World Wide Web.

The focus of the present section on databases that include peptide sequence data is for clarity of illustration only. It will be apparent to those of skill in the art that similar databases can be assembled for assay data acquired using an assay of the invention.

The compositions and methods for identifying and/or quantitating the relative and/or absolute abundance of a variety of molecular and macromolecular species from a biological sample undergoing prostate cancer, i.e., the identification of prostate cancer-associated sequences described herein, provide an abundance of information, which can be correlated with pathological conditions, predisposition to disease, drug testing, therapeutic monitoring,

gene-disease causal linkages, identification of correlates of immunity and physiological status, among others. Although the data generated from the assays of the invention is suited for manual review and analysis, in a preferred embodiment, prior data processing using high-speed computers is utilized.

An array of methods for indexing and retrieving biomolecular information is known in the art. For example, U.S. Patents 6,023,659 and 5,966,712 disclose a relational database system for storing biomolecular sequence information in a manner that allows sequences to be catalogued and searched according to one or more protein function hierarchies. U.S. Patent 5,953,727 discloses a relational database having sequence records containing information in a format that allows a collection of partial-length DNA sequences to be catalogued and searched according to association with one or more sequencing projects for obtaining full-length sequences from the collection of partial length sequences. U.S. Patent 5,706,498 discloses a gene database retrieval system for making a retrieval of a gene sequence similar to a sequence data item in a gene database based on the degree of similarity between a key sequence and a target sequence. U.S. Patent 5,538,897 discloses a method using mass spectroscopy fragmentation patterns of peptides to identify amino acid sequences in computer databases by comparison of predicted mass spectra with experimentally-derived mass spectra using a closeness-of-fit measure. U.S. Patent 5,926,818 discloses a multi-dimensional database comprising a functionality for multi-dimensional data analysis described as on-line analytical processing (OLAP), which entails the consolidation of projected and actual data according to more than one consolidation path or dimension. U.S. Patent 5,295,261 reports a hybrid database structure in which the fields of each database record are divided into two classes, navigational and informational data, with navigational fields stored in a hierarchical topological map which can be viewed as a tree structure or as the merger of two or more such tree structures.

See also Mount, et al. (2001) Bioinformatics CSH Press; Durbin, et al. (eds. 1999) Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids Cambridge Univ. Press; Baxevanis and Oeullette (eds., 1998) Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins Wiley-Liss; Rashidi and Buehler (1999) Bioinformatics: Basic Applications in Biological Science and Medicine CRC Press; Setubal, et al. (eds. 1997) Introduction to Computational Molecular Biology Brooks/Cole; Misener and Krawetz (eds. 2000) Bioinformatics: Methods and Protocols Human Press; Higgins and

Taylor (eds. 2000) Bioinformatics: Sequence, Structure, and Databanks: A Practical Approach Oxford Univ. Press; Brown (2001) Bioinformatics: A Biologist's Guide to Biocomputing and the Internet Eaton Pub; Han and Kamber (2000) Data Mining: Concepts and Techniques Kaufmann Pub.; and Waterman (1995) Introduction to Computational Biology: Maps, Sequences, and Genomes Chap and Hall.

The present invention provides a computer database comprising a computer and software for storing in computer-retrievable form assay data records cross-tabulated, e.g., with data specifying the source of the target-containing sample from which each sequence specificity record was obtained.

In an exemplary embodiment, at least one of the sources of target-containing sample is from a control tissue sample known to be free of pathological disorders. In a variation, at least one of the sources is a known pathological tissue specimen, e.g., a neoplastic lesion or another tissue specimen to be analyzed for prostate cancer. In another variation, the assay records cross-tabulate one or more of the following parameters for each target species in a sample: (1) a unique identification code, which can include, e.g., a target molecular structure and/or characteristic separation coordinate (e.g., electrophoretic coordinates); (2) sample source; and (3) absolute and/or relative quantity of the target species present in the sample.

The invention also provides for the storage and retrieval of a collection of target data in a computer data storage apparatus, which can include magnetic disks, optical disks, magneto-optical disks, DRAM, SRAM, SGRAM, SDRAM, RDRAM, DDR RAM, magnetic bubble memory devices, and other data storage devices, including CPU registers and on-CPU data storage arrays. Typically, the target data records are stored as a bit pattern in an array of magnetic domains on a magnetizable medium or as an array of charge states or transistor gate states, such as an array of cells in a DRAM device (e.g., each cell comprised of a transistor and a charge storage area, which may be on the transistor). In one embodiment, the invention provides such storage devices, and computer systems built therewith, comprising a bit pattern encoding a protein expression fingerprint record comprising unique identifiers for at least 10 target data records cross-tabulated with target source.

When the target is a peptide or nucleic acid, the invention preferably provides a method for identifying related peptide or nucleic acid sequences, comprising performing a computerized comparison between a peptide or nucleic acid sequence assay record stored in or retrieved from a computer storage device or database and at least one other sequence. The

comparison can include a sequence analysis or comparison algorithm or computer program embodiment thereof (e.g., FASTA, TFASTA, GAP, BESTFIT) and/or the comparison may be of the relative amount of a peptide or nucleic acid sequence in a pool of sequences determined from a polypeptide or nucleic acid sample of a specimen.

The invention also preferably provides a magnetic disk, such as an IBM-compatible (DOS, Windows, Windows95/98/2000, Windows NT, OS/2) or other format (e.g., Linux, SunOS, Solaris, AIX, SCO Unix, VMS, MV, Macintosh, etc.) floppy diskette or hard (fixed, Winchester) disk drive, comprising a bit pattern encoding data from an assay of the invention in a file format suitable for retrieval and processing in a computerized sequence analysis, comparison, or relative quantitation method.

The invention also provides a network, comprising a plurality of computing devices linked via a data link, such as an Ethernet cable (coax or 10BaseT), telephone line, ISDN line, wireless network, optical fiber, or other suitable signal transmission medium, whereby at least one network device (e.g., computer, disk array, etc.) comprises a pattern of magnetic domains (e.g., magnetic disk) and/or charge domains (e.g., an array of DRAM cells) composing a bit pattern encoding data acquired from an assay of the invention.

The invention also provides a method for transmitting assay data that includes generating an electronic signal on an electronic communications device, such as a modem, ISDN terminal adapter, DSL, cable modem, ATM switch, or the like, wherein the signal includes (in native or encrypted format) a bit pattern encoding data from an assay or a database comprising a plurality of assay results obtained by the method of the invention.

In a preferred embodiment, the invention provides a computer system for comparing a query target to a database containing an array of data structures, such as an assay result obtained by the method of the invention, and ranking database targets based on the degree of identity and gap weight to the target data. A central processor is preferably initialized to load and execute the computer program for alignment and/or comparison of the assay results. Data for a query target is entered into the central processor via an I/O device. Execution of the computer program results in the central processor retrieving the assay data from the data file, which comprises a binary description of an assay result.

The target data or record and the computer program can be transferred to secondary memory, which is typically random access memory (e.g., DRAM, SRAM, SGRAM, or SDRAM). Targets are ranked according to the degree of correspondence between a selected

assay characteristic (e.g., binding to a selected affinity moiety) and the same characteristic of the query target and results are output via an I/O device. For example, a central processor can be a conventional computer (e.g., Intel Pentium, PowerPC, Alpha, PA-8000, SPARC, MIPS 4400, MIPS 10000, VAX, etc.); a program can be a commercial or public domain molecular biology software package (e.g., UWGCG Sequence Analysis Software, Darwin); a data file can be an optical or magnetic disk, a data server, a memory device (e.g., DRAM, SRAM, SGRAM, SDRAM, EPROM, bubble memory, flash memory, etc.); an I/O device can be a terminal comprising a video display and a keyboard, a modem, an ISDN terminal adapter, an Ethernet port, a punched card reader, a magnetic strip reader, or other suitable I/O device.

The invention also preferably provides the use of a computer system, such as that described above, which comprises: (1) a computer; (2) a stored bit pattern encoding a collection of peptide sequence specificity records obtained by the methods of the invention, which may be stored in the computer; (3) a comparison target, such as a query target; and (4) a program for alignment and comparison, typically with rank-ordering of comparison results on the basis of computed similarity values.

Characteristics of prostate cancer-associated proteins

Prostate cancer proteins of the present invention may be classified as secreted proteins, transmembrane proteins, or intracellular proteins. In one embodiment, the prostate cancer protein is an intracellular protein. Intracellular proteins may be found in the cytoplasm and/or in the nucleus. Intracellular proteins are involved in all aspects of cellular function and replication (including, e.g., signaling pathways); aberrant expression of such proteins often results in unregulated or disregulated cellular processes (see, e.g., Alberts (ed. 1994) Molecular Biology of the Cell (3d ed.) Garland. For example, many intracellular proteins have enzymatic activity such as protein kinase activity, protein phosphatase activity, protease activity, nucleotide cyclase activity, polymerase activity and the like. Intracellular proteins also serve as docking proteins that are involved in organizing complexes of proteins, or targeting proteins to various subcellular localizations, and are involved in maintaining the structural integrity of organelles.

An increasingly appreciated concept in characterizing proteins is the presence in the proteins of one or more structural motifs for which defined functions have been attributed. In

addition to the highly conserved sequences found in the enzymatic domain of proteins, highly conserved sequences have been identified in proteins that are involved in protein-protein interaction. For example, Src-homology-2 (SH2) domains bind tyrosine-phosphorylated targets in a sequence dependent manner. PTB domains, which are distinct from SH2 domains, also bind tyrosine phosphorylated targets. SH3 domains bind to proline-rich targets. In addition, PH domains, tetratricopeptide repeats and WD domains to name only a few, have been shown to mediate protein-protein interactions. Some of these may also be involved in binding to phospholipids or other second messengers. As will be appreciated by one of ordinary skill in the art, these motifs can be identified on the basis of amino acid sequence; thus, an analysis of the sequence of proteins may provide insight into both the enzymatic potential of the molecule and/or molecules with which the protein may associate. One useful database is Pfam (protein families), which is a large collection of multiple sequence alignments and hidden Markov models covering many common protein domains. Versions are available via the internet from Washington University in St. Louis, the Sanger Center in England, and the Karolinska Institute in Sweden (see, e.g., Bateman, et al. (2000) Nuc. Acids Res. 28:263-266; Sonnhammer, et al. (1997) Proteins 28:405-420; Bateman, et al. (1999) Nuc. Acids Res. 27:260-262; and Sonnhammer, et al. (1998) Nuc. Acids Res. 26:320-322.

In another embodiment, the prostate cancer sequences are transmembrane proteins. Transmembrane proteins are molecules that span a phospholipid bilayer of a cell. They may have an intracellular domain, an extracellular domain, or both. The intracellular domains of such proteins may have a number of functions including those already described for intracellular proteins. For example, the intracellular domain may have enzymatic activity and/or may serve as a binding site for additional proteins. Frequently the intracellular domain of transmembrane proteins serves both roles. For example certain receptor tyrosine kinases have both protein kinase activity and SH2 domains. In addition, autophosphorylation of tyrosines on the receptor molecule itself, creates binding sites for additional SH2 domain containing proteins.

Transmembrane proteins may contain from one to many transmembrane domains. For example, receptor tyrosine kinases, certain cytokine receptors, receptor guanylyl cyclases and receptor serine/threonine protein kinases contain a single transmembrane domain. However, various other proteins including channels and adenylyl cyclases contain numerous

transmembrane domains. Many important cell surface receptors such as G protein coupled receptors (GPCRs) are classified as "seven transmembrane domain" proteins, as they contain 7 membrane spanning regions. Characteristics of transmembrane domains include approximately 17 consecutive hydrophobic amino acids that may be followed by charged amino acids. Therefore, upon analysis of the amino acid sequence of a particular protein, the localization and number of transmembrane domains within the protein may be predicted (see, e.g., PSORT web site http://psort.nibb.ac.jp/). Important transmembrane protein receptors include, but are not limited to the insulin receptor, insulin-like growth factor receptor, human growth hormone receptor, glucose transporters, transferrin receptor, epidermal growth factor receptor, low density lipoprotein receptor, epidermal growth factor receptor, leptin receptor, and interleukin receptors, e.g., IL-1 receptor, IL-2 receptor, etc.

The extracellular domains of transmembrane proteins are diverse; however, conserved motifs are found repeatedly among various extracellular domains. Conserved structure and/or functions have been ascribed to different extracellular motifs. Many extracellular domains are involved in binding to other molecules. In one aspect, extracellular domains are found on receptors. Factors that bind the receptor domain include circulating ligands, which may be peptides, proteins, or small molecules such as adenosine and the like. For example, growth factors such as EGF, FGF, and PDGF are circulating growth factors that bind to their cognate receptors to initiate a variety of cellular responses. Other factors include cytokines, mitogenic factors, neurotrophic factors and the like. Extracellular domains also bind to cell-associated molecules. In this respect, they mediate cell-cell interactions. Cell-associated ligands can be tethered to the cell, e.g., via a glycosylphosphatidylinositol (GPI) anchor, or may themselves be transmembrane proteins. Extracellular domains also associate with the extracellular matrix and contribute to the maintenance of the cell structure.

Prostate cancer proteins that are transmembrane are particularly preferred in the present invention as they are readily accessible targets for immunotherapeutics, as are described herein. In addition, as outlined below, transmembrane proteins can be also useful in imaging modalities. Antibodies may be used to label such readily accessible proteins in situ. Alternatively, antibodies can also label intracellular proteins, in which case samples are typically permeablized to provide access to intracellular proteins.. In addition, some membrane proteins can be processed to release a soluble protein, or to expose a residual

fragment. Released soluble proteins may be useful diagnostic markers, processed residual protein fragments may be useful prostate markers of disease.

It will also be appreciated by those in the art that a transmembrane protein can be made soluble by removing transmembrane sequences, e.g., through recombinant methods. Furthermore, transmembrane proteins that have been made soluble can be made to be secreted through recombinant means by adding an appropriate signal sequence.

In another embodiment, the prostate cancer proteins are secreted proteins; the secretion of which can be either constitutive or regulated. These proteins may have a signal peptide or signal sequence that targets the molecule to the secretory pathway. Secreted proteins are involved in numerous physiological events; by virtue of their circulating nature, they often serve to transmit signals to various other cell types. The secreted protein may function in an autocrine manner (acting on the cell that secreted the factor), a paracrine manner (acting on cells in close proximity to the cell that secreted the factor), an endocrine manner (acting on cells at a distance, e.g, secretion into the blood stream), or an exocrine manner (secretion, e.g., through a duct or to adjacent epithelial surface as sweat glands, sebaceous glands, pancreatic ducts, lacrimal glands, mammary glands, sax producing glands of the ear, etc.). Thus secreted molecules find use in modulating or altering numerous aspects of physiology. Prostate cancer proteins that are secreted proteins are particularly preferred in the present invention as they serve as good targets for diagnostic markers, e.g., for blood, plasma, serum, or stool tests. Those which are enzymes may be antibody or small molecule targets. Others may be useful as vaccine targets, e.g., via CTL mechanisms.

Use of prostate cancer nucleic acids

As described above, prostate cancer sequence is initially identified by substantial nucleic acid and/or amino acid sequence homology or linkage to the prostate cancer sequences outlined herein. Such homology can be based upon the overall nucleic acid or amino acid sequence, and is generally determined as outlined below, using either homology programs or hybridization conditions. Typically, linked sequences on a mRNA are found on the same molecule.

The prostate cancer nucleic acid sequences of the invention, e.g., the sequences in Tables 1A-4, can be fragments of larger genes, i.e., they are nucleic acid segments. "Genes" in this context includes coding regions, non-coding regions, and mixtures of coding and non-

coding regions. Accordingly, as will be appreciated by those in the art, using the sequences provided herein, extended sequences, in either direction, of the prostate cancer genes can be obtained, using techniques well known in the art for cloning either longer sequences or the full length sequences; see Ausubel, et al., supra. Much can be done by informatics and many sequences can be clustered to include multiple sequences corresponding to a single gene, e.g., systems such as UniGene (see, http://www.ncbi.nlm.nih.gov/UniGene/).

Once the prostate cancer nucleic acid is identified, it can be cloned and, if necessary, its constituent parts recombined to form the entire prostate cancer nucleic acid coding regions or the entire mRNA sequence. Once isolated from its natural source, e.g., contained within a plasmid or other vector or excised therefrom as a linear nucleic acid segment, the recombinant prostate cancer nucleic acid can be further-used as a probe to identify and isolate other prostate cancer nucleic acids, e.g., extended coding regions. It can also be used as a "precursor" nucleic acid to make modified or variant prostate cancer nucleic acids and proteins.

The prostate cancer nucleic acids of the present invention are used in several ways. In a first embodiment, nucleic acid probes to the prostate cancer nucleic acids are made and attached to biochips to be used in screening and diagnostic methods, as outlined below, or for administration, e.g., for gene therapy, vaccine, and/or antisense applications. Alternatively, the prostate cancer nucleic acids that include coding regions of prostate cancer proteins can be put into expression vectors for the expression of prostate cancer proteins, again for screening purposes or for administration to a patient.

In a preferred embodiment, nucleic acid probes to prostate cancer nucleic acids (both the nucleic acid sequences outlined in the figures and/or the complements thereof) are made. The nucleic acid probes attached to the biochip are designed to be substantially complementary to the prostate cancer nucleic acids, i.e., the target sequence (either the target sequence of the sample or to other probe sequences, e.g., in sandwich assays), such that hybridization of the target sequence and the probes of the present invention occurs. As outlined below, this complementarity need not be perfect; there may be base pair mismatches which will interfere with hybridization between the target sequence and the single stranded nucleic acids of the present invention. However, if the number of mutations is so great that no hybridization can occur under even the least stringent of hybridization conditions, the sequence is not a complementary target sequence. Thus, by "substantially complementary"

herein is meant that the probes are sufficiently complementary to the target sequences to hybridize under normal reaction conditions, particularly high stringency conditions, as outlined herein.

A nucleic acid probe is generally single stranded but can be partially single and partially double stranded. The strandedness of the probe is dictated by the structure, composition, and properties of the target sequence. In general, the nucleic acid probes range from about 8 to about 100 bases long, with from about 10 to about 80 bases being preferred, and from about 30 to about 50 bases being particularly preferred. That is, generally whole genes are not used. In some embodiments, much longer nucleic acids can be used, up to hundreds of bases.

In a preferred embodiment, more than one probe per sequence is used, with either overlapping probes or probes to different sections of the target being used. That is, two, three, four or more probes, with three being preferred, are used to build in a redundancy for a particular target. The probes can be overlapping (i.e., have some sequence in common), or separate. In some cases, PCR primers may be used to amplify signal for higher sensitivity.

As will be appreciated by those in the art, nucleic acids can be attached or immobilized to a solid support in a wide variety of ways. By "immobilized" and grammatical equivalents herein is meant the association or binding between the nucleic acid probe and the solid support is sufficient to be stable under the conditions of binding, washing, analysis, and removal as outlined below. The binding can typically be covalent or non-covalent. By "non-covalent binding" and grammatical equivalents herein is meant one or more of electrostatic, hydrophilic, and hydrophobic interactions. Included in non-covalent binding is the covalent attachment of a molecule, such as, streptavidin to the support and the non-covalent binding of the biotinylated probe to the streptavidin. By "covalent binding" and grammatical equivalents herein is meant that the two moieties, the solid support and the probe, are attached by at least one bond, including sigma bonds, pi bonds and coordination bonds. Covalent bonds can be formed directly between the probe and the solid support or can be formed by a cross linker or by inclusion of a specific reactive group on either the solid support or the probe or both molecules. Immobilization may also involve a combination of covalent and non-covalent interactions.

In general, the probes are attached to the biochip in a wide variety of ways, as will be appreciated by those in the art. As described herein, the nucleic acids can either be

synthesized first, with subsequent attachment to the biochip, or can be directly synthesized on the biochip.

The biochip comprises a suitable solid substrate. By "substrate" or "solid support" or other grammatical equivalents herein is meant a material that can be modified to contain discrete individual sites appropriate for the attachment or association of the nucleic acid probes and is amenable to at least one detection method. As will be appreciated by those in the art, the number of possible substrates are very large, and include, but are not limited to, glass and modified or functionalized glass, plastics (including acrylics, polystyrene and copolymers of styrene and other materials, polypropylene, polyethylene, polybutylene, polyurethanes, TeflonJ, etc.), polysaccharides, nylon or nitrocellulose, resins, silica or silica-based materials including silicon and modified silicon, carbon, metals, inorganic glasses, plastics, etc. In general, the substrates allow optical detection and do not appreciably fluoresce. A preferred substrate is described in WO0055627, herein incorporated by reference in its entirety.

Generally the substrate is planar, although as will be appreciated by those in the art, other configurations of substrates may be used as well. For example, the probes may be placed on the inside surface of a tube, for flow-through sample analysis to minimize sample volume. Similarly, the substrate may be flexible, such as a flexible foam, including closed cell foams made of particular plastics.

In a preferred embodiment, the surface of the biochip and the probe may be derivatized with chemical functional groups for subsequent attachment of the two. Thus, e.g., the biochip is derivatized with a chemical functional group including, but not limited to, amino groups, carboxy groups, oxo groups and thiol groups, with amino groups being particularly preferred. Using these functional groups, the probes can be attached using functional groups on the probes. For example, nucleic acids containing amino groups can be attached to surfaces comprising amino groups, e.g., using linkers as are known in the art; e.g., homo-or hetero-bifunctional linkers as are well known (see 1994 Pierce Chemical Company catalog, technical section on cross-linkers, pages 155-200). In addition, in some cases, additional linkers, such as alkyl groups (including substituted and heteroalkyl groups) may be used.

In this embodiment, oligonucleotides are synthesized as is known in the art, and then attached to the surface of the solid support. As will be appreciated by those skilled in the art,

either the 5' or 3' terminus may be attached to the solid support, or attachment may be via an internal nucleoside.

In another embodiment, the immobilization to the solid support may be very strong, yet non-covalent. For example, biotinylated oligonucleotides can be made, which bind to surfaces covalently coated with streptavidin, resulting in attachment.

Alternatively, the oligonucleotides may be synthesized on the surface, as is known in the art. For example, photoactivation techniques utilizing photopolymerization compounds and techniques are used. In a preferred embodiment, the nucleic acids can be synthesized in situ, using well known photolithographic techniques, such as those described in WO 95/25116; WO 95/35505; U.S. Patent Nos. 5,700,637 and 5,445,934; and references cited within, all of which are expressly incorporated by reference; these methods of attachment form the basis of the Affymetrix GeneChip™ technology.

Often, amplification-based assays are performed to measure the expression level of prostate cancer-associated sequences. These assays are typically performed in conjunction with reverse transcription. In such assays, a prostate cancer-associated nucleic acid sequence acts as a template in an amplification reaction (e.g., Polymerase Chain Reaction, or PCR). In a quantitative amplification, the amount of amplification product will be proportional to the amount of template in the original sample. Comparison to appropriate controls provides a measure of the amount of prostate cancer-associated RNA. Methods of quantitative amplification are well known to those of skill in the art. Detailed protocols for quantitative PCR are provided, e.g., in Innis, et al. (1990) PCR Protocols: A Guide to Methods and Applications Academic Press.

In some embodiments, a TaqMan based assay is used to measure expression. TaqMan based assays use a fluorogenic oligonucleotide probe that contains a 5' fluorescent dye and a 3' quenching agent. The probe hybridizes to a PCR product, but cannot itself be extended due to a blocking agent at the 3' end. When the PCR product is amplified in subsequent cycles, the 5' nuclease activity of the polymerase, e.g., AmpliTaq, results in the cleavage of the TaqMan probe. This cleavage separates the 5' fluorescent dye and the 3' quenching agent, thereby resulting in an increase in fluorescence as a function of amplification (see, e.g., literature provided by Perkin-Elmer, e.g., www2.perkin-elmer.com).

Other suitable amplification methods include, but are not limited to, ligase chain reaction (LCR) (see Wu and Wallace (1989) Genomics 4:560-569, Landegren, et al. (1988)

Science 241:1077-1080, and Barringer, et al. (1990) Gene 89:117-122), transcription amplification (Kwoh, et al. (1989) Proc. Natl. Acad. Sci. USA 86:1173-1177), self-sustained sequence replication (Guatelli, et al. (1990) Proc. Nat. Acad. Sci. USA 87:1874-1878), dot PCR, and linker adapter PCR, etc.

Expression of prostate cancer proteins from nucleic acids

In a preferred embodiment, prostate cancer nucleic acids, e.g., encoding prostate cancer proteins are used to make a variety of expression vectors to express prostate cancer proteins which can then be used in screening assays, as described below. Expression vectors and recombinant DNA technology are well known to those of skill in the art (see, e.g., Ausubel, supra, and Fernandez and Hoeffler (eds. 1999) Gene Expression Systems Academic Press) and are used to express proteins. The expression vectors may be either self-replicating extrachromosomal vectors or vectors which integrate into a host genome. Generally, these expression vectors include transcriptional and translational regulatory nucleic acid operably linked to the nucleic acid encoding the prostate cancer protein. The term "control sequences" refers to DNA sequences used for the expression of an operably linked coding sequence in a particular host organism. Control sequences that are suitable for prokaryotes, e.g., include a promoter, optionally an operator sequence, and a ribosome binding site. Eukaryotic cells are known to utilize promoters, polyadenylation signals, and enhancers.

Nucleic acid is "operably linked" when it is placed into a functional relationship with another nucleic acid sequence. For example, DNA for a presequence or secretory leader is operably linked to DNA for a polypeptide if it is expressed as a preprotein that participates in the secretion of the polypeptide; a promoter or enhancer is operably linked to a coding sequence if it affects the transcription of the sequence; a ribosome binding site is operably linked to a coding sequence if it is positioned so as to facilitate translation, and sequences may be operably linked when they are physically linked on the same molecule. Generally, "operably linked" means that the DNA sequences being linked are contiguous, and, in the case of a secretory leader, contiguous and in reading phase. However, enhancers do not have to be contiguous. Linking is typically accomplished by ligation at convenient restriction sites. If such sites do not exist, synthetic oligonucleotide adaptors or linkers are used in accordance with conventional practice. Transcriptional and translational regulatory nucleic acid will generally be appropriate to the host cell used to express the prostate cancer protein.

Numerous types of appropriate expression vectors, and suitable regulatory sequences are known in the art for a variety of host cells.

In general, transcriptional and translational regulatory sequences may include, but are not limited to, promoter sequences, ribosomal binding sites, transcriptional start and stop sequences, translational start and stop sequences, and enhancer or activator sequences. In a preferred embodiment, the regulatory sequences include a promoter and transcriptional start and stop sequences.

Promoter sequences encode either constitutive or inducible promoters. The promoters may be either naturally occurring promoters or hybrid promoters. Hybrid promoters, which combine elements of more than one promoter, are also known in the art, and are useful in the present invention.

In addition, an expression vector may comprise additional elements. For example, the expression vector may have two replication systems, thus allowing it to be maintained in two organisms, e.g., in mammalian or insect cells for expression and in a prokaryotic host for cloning and amplification. Furthermore, for integrating expression vectors, the expression vector contains at least one sequence homologous to the host cell genome, and preferably two homologous sequences which flank the expression construct. The integrating vector may be directed to a specific locus in the host cell by selecting the appropriate homologous sequence for inclusion in the vector. Constructs for integrating vectors are well known in the art (e.g., Fernandez and Hoeffler, supra).

In addition, in a preferred embodiment, the expression vector contains a selectable marker gene to allow the selection of transformed host cells. Selection genes are well known in the art and will vary with the host cell used.

The prostate cancer proteins of the present invention are produced by culturing a host cell transformed with an expression vector containing nucleic acid encoding a prostate cancer protein, under the appropriate conditions to induce or cause expression of the prostate cancer protein. Conditions appropriate for prostate cancer protein expression will vary with the choice of the expression vector and the host cell, and will be easily ascertained by one skilled in the art through routine experimentation or optimization. For example, the use of constitutive promoters in the expression vector will require optimizing the growth and proliferation of the host cell, while the use of an inducible promoter requires the appropriate growth conditions for induction. In addition, in some embodiments, the timing of the harvest

is important. For example, the baculoviral systems used in insect cell expression are lytic viruses, and thus harvest time selection can be crucial for product yield.

Appropriate host cells include yeast, bacteria, archaebacteria, fungi, and insect and animal cells, including mammalian cells. Of particular interest are Saccharomyces cerevisiae and other yeasts, E. coli, Bacillus subtilis, Sf9 cells, C129 cells, 293 cells, Neurospora, BHK, CHO, COS, HeLa cells, HUVEC (human umbilical vein endothelial cells), THP1 cells (a macrophage cell line) and various other human cells and cell lines.

In a preferred embodiment, the prostate cancer proteins are expressed in mammalian cells. Mammalian expression systems are also known in the art, and include retroviral and adenoviral systems. One expression vector system is a retroviral vector system such as is generally described in PCT/US97/01019 and PCT/US97/01048, both of which are hereby expressly incorporated by reference. Of particular use as mammalian promoters are the promoters from mammalian viral genes, since the viral genes are often highly expressed and have a broad host range. Examples include the SV40 early promoter, mouse mammary tumor virus LTR promoter, adenovirus major late promoter, herpes simplex virus promoter, and the CMV promoter (see, e.g., Fernandez and Hoeffler, supra). Typically, transcription termination and polyadenylation sequences recognized by mammalian cells are regulatory regions located 3' to the translation stop codon and thus, together with the promoter elements, flank the coding sequence. Examples of transcription terminator and polyadenylation signals include those derived form SV40.

The methods of introducing exogenous nucleic acid into mammalian hosts, as well as other hosts, is well known in the art, and will vary with the host cell used. Techniques include dextran-mediated transfection, calcium phosphate precipitation, polybrene mediated transfection, protoplast fusion, electroporation, viral infection, encapsulation of the polynucleotide(s) in liposomes, and direct microinjection of the DNA into nuclei.

In a preferred embodiment, prostate cancer proteins are expressed in bacterial systems. Bacterial expression systems are well known in the art. Promoters from bacteriophage may also be used and are known in the art. In addition, synthetic promoters and hybrid promoters are also useful; e.g., the tac promoter is a hybrid of the trp and lac promoter sequences. Furthermore, a bacterial promoter can include naturally occurring promoters of non-bacterial origin that have the ability to bind bacterial RNA polymerase and initiate transcription. In addition to a functioning promoter sequence, an efficient ribosome

binding site is desirable. The expression vector may also include a signal peptide sequence that provides for secretion of the prostate cancer protein in bacteria. The protein is either secreted into the growth media (gram-positive bacteria) or into the periplasmic space, located between the inner and outer membrane of the cell (gram-negative bacteria). The bacterial expression vector may also include a selectable marker gene to allow for the selection of bacterial strains that have been transformed. Suitable selection genes include genes which render the bacteria resistant to drugs such as ampicillin, chloramphenicol, erythromycin, kanamycin, neomycin and tetracycline. Selectable markers also include biosynthetic genes, such as those in the histidine, tryptophan and leucine biosynthetic pathways. These components are assembled into expression vectors. Expression vectors for bacteria are well known in the art, and include vectors for Bacillus subtilis, E. coli, Streptococcus cremoris, and Streptococcus lividans, among others (e.g., Fernandez and Hoeffler, supra). The bacterial expression vectors are transformed into bacterial host cells using techniques well known in the art, such as calcium chloride treatment, electroporation, and others.

In one embodiment, prostate cancer proteins are produced in insect cells. Expression vectors for the transformation of insect cells, and in particular, baculovirus-based expression vectors, are well known in the art.

In a preferred embodiment, prostate cancer protein is produced in yeast cells. Yeast expression systems are well known in the art, and include expression vectors for Saccharomyces cerevisiae, Candida albicans and C. maltosa, Hansenula polymorpha, Kluyveromyces fragilis and K. lactis, Pichia guillerimondii and P. pastoris, Schizosaccharomyces pombe, and Yarrowia lipolytica.

The prostate cancer protein may also be made as a fusion protein, using techniques well known in the art. Thus, e.g., for the creation of monoclonal antibodies, if the desired epitope is small, the prostate cancer protein may be fused to a carrier protein to form an immunogen. Alternatively, the prostate cancer protein may be made as a fusion protein to increase expression, or for other reasons. For example, when the prostate cancer protein is a prostate cancer peptide, the nucleic acid encoding the peptide may be linked to other nucleic acid for expression purposes.

In a preferred embodiment, the prostate cancer protein is purified or isolated after expression. Prostate cancer proteins may be isolated or purified in a variety of ways known to those skilled in the art depending on what other components are present in the sample.

Standard purification methods include electrophoretic, molecular, immunological and chromatographic techniques, including ion exchange, hydrophobic, affinity, and reverse-phase HPLC chromatography, and chromatofocusing. For example, the prostate cancer protein may be purified using a standard anti-prostate cancer protein antibody column. Ultrafiltration and diafiltration techniques, in conjunction with protein concentration, are also useful. For general guidance in suitable purification techniques, see Scopes (1982) Protein Purification Springer-Verlag. The degree of purification necessary will vary depending on the use of the prostate cancer protein. In some instances no purification will be necessary.

Once expressed and purified if necessary, the prostate cancer proteins and nucleic acids are useful in a number of applications. They may be used as immunoselection reagents, as vaccine reagents, as screening agents, etc.

Variants of prostate cancer proteins

In one embodiment, the prostate cancer proteins are derivative or variant prostate cancer proteins as compared to the wild-type sequence. That is, as outlined more fully below, the derivative prostate cancer peptide will often contain at least one amino acid substitution, deletion or insertion, with amino acid substitutions being particularly preferred. The amino acid substitution, insertion, or deletion may occur at most any residue within the prostate cancer peptide.

Also included within one embodiment of prostate cancer proteins of the present invention are amino acid sequence variants. These variants typically fall into one or more of three classes: substitutional, insertional, or deletional variants. These variants ordinarily are prepared by site specific mutagenesis of nucleotides in the DNA encoding the prostate cancer protein, using cassette or PCR mutagenesis or other techniques well known in the art, to produce DNA encoding the variant, and thereafter expressing the DNA in recombinant cell culture as outlined above. However, variant prostate cancer protein fragments having up to about 100-150 residues may be prepared by in vitro synthesis using established techniques. Amino acid sequence variants are characterized by the predetermined nature of the variation, a feature that sets them apart from naturally occurring allelic or interspecies variation of the prostate cancer protein amino acid sequence. The variants typically exhibit the same qualitative biological activity as the naturally occurring analogue, although variants can also be selected which have modified characteristics as will be more fully outlined below.

While the site or region for introducing an amino acid sequence variation is predetermined, the mutation per se need not be predetermined. For example, in order to optimize the performance of a mutation at a given site, random mutagenesis may be conducted at the target codon or region and the expressed prostate cancer variants screened for the optimal combination of desired activity. Techniques for making substitution mutations at predetermined sites in DNA having a known sequence are well known, e.g., M13 primer mutagenesis and PCR mutagenesis. Screening of the mutants is done using assays of prostate cancer protein activities.

Amino acid substitutions are typically of single residues; insertions usually will be on the order of from about 1 to 20 amino acids, although considerably larger insertions may be tolerated. Deletions range from about 1 to about 20 residues, although in some cases deletions may be much larger.

Substitutions, deletions, insertions or a combination thereof may be used to arrive at a final derivative. Generally these changes are done on a few amino acids to minimize the alteration of the molecule. However, larger changes may be tolerated in certain circumstances. When small alterations in the characteristics of the prostate cancer protein are desired, substitutions are generally made in accordance with the amino acid substitution relationships provided in the definition section.

The variants typically exhibit the same qualitative biological activity and will elicit the same immune response as the naturally-occurring analog, although variants also are selected to modify the characteristics of the prostate cancer proteins as needed. Alternatively, the variant may be designed such that the biological activity of the prostate cancer protein is altered. For example, glycosylation sites may be altered or removed.

Substantial changes in function or immunological identity are made by selecting substitutions that are less conservative than those described above. For example, substitutions may be made which more significantly affect: the structure of the polypeptide backbone in the area of the alteration, for example the alpha-helical or beta-sheet structure; the charge or hydrophobicity of the molecule at the target site; or the bulk of the side chain. The substitutions which in general are expected to produce the greatest changes in the polypeptide's properties are those in which (a) a hydrophilic residue, e.g., serinyl or threonyl is substituted for (or by) a hydrophobic residue, e.g., leucyl, isoleucyl, phenylalanyl, valyl or alanyl; (b) a cysteine or proline is substituted for (or by) another residue; (c) a residue having

an electropositive side chain, e.g., lysyl, arginyl, or histidyl, is substituted for (or by) an electronegative residue, e.g., glutamyl or aspartyl; or (d) a residue having a bulky side chain, e.g., phenylalanine, is substituted for (or by) one not having a side chain, e.g., glycine.

Covalent modifications of prostate cancer polypeptides are included within the scope of this invention. One type of covalent modification includes reacting targeted amino acid residues of a prostate cancer polypeptide with an organic derivatizing agent that is capable of reacting with selected side chains or the N-or C-terminal residues of a prostate cancer polypeptide. Derivatization with bifunctional agents is useful, for instance, for crosslinking prostate cancer polypeptides to a water-insoluble support matrix or surface for use in the method for purifying anti-prostate cancer polypeptide antibodies or screening assays, as is more fully described below. Commonly used crosslinking agents include, e.g., 1,1-bis(diazoacetyl)-2-phenylethane, glutaraldehyde, N-hydroxysuccinimide esters, e.g., esters with 4-azidosalicylic acid, homobifunctional imidoesters, including disuccinimidyl esters such as 3,3'-dithiobis(succinimidylpropionate), bifunctional maleimides such as bis-N-maleimido-1,8-octane and agents such as methyl-3-((p-azidophenyl)dithio)propioimidate.

Other modifications include deamidation of glutaminyl and asparaginyl residues to the corresponding glutamyl and aspartyl residues, respectively, hydroxylation of proline and lysine, phosphorylation of hydroxyl groups of serinyl, threonyl or tyrosyl residues, methylation of the amino groups of the lysine, arginine, and histidine side chains (e.g., pp. 79-86, Creighton (1983) Proteins: Structure and Molecular Properties Freeman), acetylation of the N-terminal amine, and amidation of a C-terminal carboxyl group.

Another type of covalent modification of the prostate cancer polypeptide included within the scope of this invention comprises altering the native glycosylation pattern of the polypeptide. "Altering the native glycosylation pattern" is intended for purposes herein to mean deleting one or more carbohydrate moieties found in native sequence prostate cancer polypeptide, and/or adding one or more glycosylation sites that are not present in the native sequence prostate cancer polypeptide. Glycosylation patterns can be altered in many ways. For example the use of different cell types to express prostate cancer-associated sequences can result in different glycosylation patterns.

Addition of glycosylation sites to prostate cancer polypeptides may also be accomplished by altering the amino acid sequence thereof. The alteration may be made, e.g., by the addition of, or substitution by, one or more serine or threonine residues to the native

sequence prostate cancer polypeptide (for O-linked glycosylation sites). The prostate cancer amino acid sequence may optionally be altered through changes at the DNA level, particularly by mutating the DNA encoding the prostate cancer polypeptide at preselected bases such that codons are generated that will translate into the desired amino acids.

Another means of increasing the number of carbohydrate moieties on the prostate cancer polypeptide is by chemical or enzymatic coupling of glycosides to the polypeptide. Such methods are described in the art, e.g., in WO 87/05330, and pp. 259-306 in Aplin and Wriston (1981) CRC Crit. Rev. Biochem.

Removal of carbohydrate moieties present on the prostate cancer polypeptide may be accomplished chemically or enzymatically or by mutational substitution of codons encoding for amino acid residues that serve as targets for glycosylation. Chemical deglycosylation techniques are known in the art and described, e.g., by Hakimuddin, et al. (1987) Arch. Biochem. Biophys. 259:52-57; and Edge, et al. (1981) Anal. Biochem. 118:131-137. Enzymatic cleavage of carbohydrate moieties on polypeptides can be achieved by the use of a variety of endo-and exo-glycosidases as described by Thotakura, et al. (1987) Meth. Enzymol. 138:350-359.

Another type of covalent modification of prostate cancer comprises linking the prostate cancer polypeptide to one of a variety of nonproteinaceous polymers, e.g., polyethylene glycol, polypropylene glycol, or polyoxyalkylenes, in the manner set forth in U.S. Patent Nos. 4,640,835; 4,496,689; 4,301,144; 4,670,417; 4,791,192; or 4,179,337.

Prostate cancer polypeptides of the present invention may also be modified in a way to form chimeric molecules comprising a prostate cancer polypeptide fused to another, heterologous polypeptide or amino acid sequence. In one embodiment, such a chimeric molecule comprises a fusion of a prostate cancer polypeptide with a tag polypeptide which provides an epitope to which an anti-tag antibody can selectively bind. The epitope tag is generally placed at the amino-or carboxyl-terminus of the prostate cancer polypeptide. The presence of such epitope-tagged forms of a prostate cancer polypeptide can be detected using an antibody against the tag polypeptide. Also, provision of the epitope tag enables the prostate cancer polypeptide to be readily purified by affinity purification using an anti-tag antibody or another type of affinity matrix that binds to the epitope tag. In an alternative embodiment, the chimeric molecule may comprise a fusion of a prostate cancer polypeptide

with an immunoglobulin or a particular region of an immunoglobulin. For a bivalent form of the chimeric molecule, such a fusion could be to the Fc region of an IgG molecule.

Various tag polypeptides and their respective antibodies are well known in the art. Examples include poly-histidine (poly-his) or poly-histidine-glycine (poly-his-gly) tags; HIS6 and metal chelation tags, the flu HA tag polypeptide and its antibody 12CA5 (Field, et al. (1988) Mol. Cell. Biol. 8:2159-2165; the c-myc tag and the 8F9, 3C7, 6E10, G4, B7, and 9E10 antibodies thereto (Evan, et al. (1985) Molecular and Cellular Biology 5:3610-3616); and the Herpes Simplex virus glycoprotein D (gD) tag and its antibody (Paborsky, et al. (1990) Protein Engineering 3:547-553). Other tag polypeptides include the Flag-peptide (Hopp, et al. (1988) BioTechnology 6:1204-1210); the KT3 epitope peptide (Martin, et al. (1992) Science 255:192-194); tubulin epitope peptide (Skinner, et al. (1991) J. Biol. Chem. 266:15163-15166); and the T7 gene 10 protein peptide tag (Lutz-Freyermuth, et al. (1990) Proc. Natl. Acad. Sci. USA 87:6393-6397).

Also included are other prostate cancer proteins of the prostate cancer family, and prostate cancer proteins from other organisms, which are cloned and expressed as outlined below. Thus, probe or degenerate polymerase chain reaction (PCR) primer sequences may be used to find other related prostate cancer proteins from humans or other organisms. As will be appreciated by those in the art, particularly useful probe and/or PCR primer sequences include the unique areas of the prostate cancer nucleic acid sequence. As is generally known in the art, preferred PCR primers are from about 15 to about 35 nucleotides in length, with from about 20 to about 30 being preferred, and may contain inosine as needed. The conditions for the PCR reaction are well known in the art (e.g., Innis, PCR Protocols, supra).

Antibodies to prostate cancer proteins

In a preferred embodiment, when the prostate cancer protein is to be used to generate antibodies, e.g., for immunotherapy or immunodiagnosis, the prostate cancer protein should share at least one epitope or determinant with the full length protein. By "epitope" or "determinant" herein is typically meant a portion of a protein which will generate and/or bind an antibody or T-cell receptor in the context of MHC. Thus, in most instances, antibodies made to a smaller prostate cancer protein will be able to bind to the full-length protein, particularly linear epitopes. In a preferred embodiment, the epitope is unique; that is, antibodies generated to a unique epitope show little or no cross-reactivity.

Methods of preparing polyclonal antibodies are known to the skilled artisan (e.g., Coligan, supra; and Harlow and Lane, supra). Polyclonal antibodies can be raised in a mammal, e.g., by one or more injections of an immunizing agent and, if desired, an adjuvant. Typically, the immunizing agent and/or adjuvant will be injected in the mammal by multiple subcutaneous or intraperitoneal injections. The immunizing agent may include a protein encoded by a nucleic acid of the figures or fragment thereof or a fusion protein thereof. It may be useful to conjugate the immunizing agent to a protein known to be immunogenic in the mammal being immunized. Examples of such immunogenic proteins include but are not limited to keyhole limpet hemocyanin, serum albumin, bovine thyroglobulin, and soybean trypsin inhibitor. Examples of adjuvants which may be employed include Freund's complete adjuvant and MPL-TDM adjuvant (monophosphoryl Lipid A, synthetic trehalose dicorynomycolate). The immunization protocol may be selected by one skilled in the art without undue experimentation.

The antibodies may, alternatively, be monoclonal antibodies. Monoclonal antibodies may be prepared using hybridoma methods, such as those described by Kohler and Milstein (1975) Nature 256:495. In a hybridoma method, a mouse, hamster, or other appropriate host animal, is typically immunized with an immunizing agent to elicit lymphocytes that produce or are capable of producing antibodies that will specifically bind to the immunizing agent. Alternatively, the lymphocytes may be immunized in vitro. The immunizing agent will typically include a polypeptide encoded by a nucleic acid of Tables 1A-4 or fragment thereof, or a fusion protein thereof. Generally, either peripheral blood lymphocytes ("PBLs") are used if cells of human origin are desired, or spleen cells or lymph node cells are used if non-human mammalian sources are desired. The lymphocytes are then fused with an immortalized cell line using a suitable fusing agent, such as polyethylene glycol, to form a hybridoma cell (see pp. 59-103 in Goding (1986) Monoclonal Antibodies: Principles and Practice Academic Press). Immortalized cell lines are usually transformed mammalian cells, particularly myeloma cells of rodent, bovine and human origin. Usually, rat or mouse myeloma cell lines are employed. The hybridoma cells may be cultured in a suitable culture medium that preferably contains one or more substances that inhibit the growth or survival of the unfused, immortalized cells. For example, if the parental cells lack the enzyme hypoxanthine guanine phosphoribosyl transferase (HGPRT or HPRT), the culture medium

for the hybridomas typically will include hypoxanthine, aminopterin, and thymidine ("HAT medium"), which substances prevent the growth of HGPRT-deficient cells.

In one embodiment, the antibodies are bispecific antibodies. Bispecific antibodies are monoclonal, preferably human or humanized, antibodies that have binding specificities for at least two different antigens or that have binding specificities for two epitopes on the same antigen. In one embodiment, one of the binding specificities is for a protein encoded by a nucleic acid of Tables 1A-4 or a fragment thereof, the other one is for another antigen, and preferably for a cell-surface protein or receptor or receptor subunit, preferably one that is tumor specific. Alternatively, tetramer-type technology may create multivalent reagents.

In a preferred embodiment, the antibodies to prostate cancer protein are capable of reducing or eliminating a biological function of a prostate cancer protein, as is described below. That is, the addition of anti-prostate cancer protein antibodies (either polyclonal or preferably monoclonal) to prostate cancer tissue (or cells containing prostate cancer) may reduce or eliminate the prostate cancer. Generally, at least a 25% decrease in activity, growth, size or the like is preferred, with at least about 50% being particularly preferred and about a 95-100% decrease being especially preferred.

In a preferred embodiment the antibodies to the prostate cancer proteins are humanized antibodies (e.g., Xenerex Biosciences; Medarex, Inc.; Abgenix, Inc.; Protein Design Labs, Inc.). Humanized forms of non-human (e.g., murine) antibodies are chimeric molecules of immunoglobulins, immunoglobulin chains or fragments thereof (such as Fv, Fab, Fab', F(ab')2 or other antigen-binding subsequences of antibodies) which contain minimal sequence derived from non-human immunoglobulin. Humanized antibodies include human immunoglobulins (recipient antibody) in which residues from a complementary determining region (CDR) of the recipient are replaced by residues from a CDR of a non-human species (donor antibody) such as mouse, rat or rabbit having the desired specificity, affinity and capacity. In some instances, Fv framework residues of the human immunoglobulin are replaced by corresponding non-human residues. Humanized antibodies may also comprise residues which are found neither in the recipient antibody nor in the imported CDR or framework sequences. In general, a humanized antibody will comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the CDR regions correspond to those of a non-human immunoglobulin and all or substantially all of the framework (FR) regions are those of a human

immunoglobulin consensus sequence. The humanized antibody optimally also will comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin (Jones, et al. (1986) Nature 321:522-525; Riechmann, et al. (1988) Nature 332:323-329; and Presta (1992) Curr. Op. Struct. Biol. 2:593-596). Humanization can be essentially performed following methods of Winter and co-workers (see, e.g., Jones, et al. (1986) Nature 321:522-525; Riechmann, et al. (1988) Nature 332:323-327; and Verhoeyen, et al. (1988) Science 239:1534-1536), by substituting rodent CDRs or CDR sequences for the corresponding sequences of a human antibody. Accordingly, such humanized antibodies are chimeric antibodies (U.S. Patent No. 4,816,567), wherein substantially less than an intact human variable domain has been substituted by the corresponding sequence from a non-human species.

Human antibodies can also be produced using various techniques known in the art, including phage display libraries (Hoogenboom and Winter (1991) J. Mol. Biol. 227:381-388; Marks, et al. (1991) J. Mol. Biol. 222:581-597) or the preparation of human monoclonal antibodies (e.g., p77 in Cole, et al. (1985) Monoclonal Antibodies and Cancer Therapy Liss; and Boerner, et al. (1991) J. Immunol. 147(1):86-95). Similarly, human antibodies can be made by introducing of human immunoglobulin loci into transgenic animals, e.g., mice in which the endogenous immunoglobulin genes have been partially or completely inactivated. Upon challenge, human antibody production is observed, which closely resembles that seen in humans in most respects, including gene rearrangement, assembly, and antibody repertoire. This approach is described, e.g., in U.S. Patent Nos. 5,545,807; 5,545,806; 5,569,825; 5,625,126; 5,633,425; 5,661,016, and in the following scientific publications: Marks, et al. (1992) Bio/Technology 10:779-783; Lonberg, et al. (1994) Nature 368:856-859; Morrison (1994) Nature 368:812-13; Fishwild, et al. (1996) Nature Biotechnology 14:845-51; Neuberger (1996) Nature Biotechnology 14:826; Lonberg and Huszar (1995) Intern. Rev. Immunol. 13:65-93.

By immunotherapy is meant treatment of prostate cancer with an antibody raised against prostate cancer proteins. As used herein, immunotherapy can be passive or active. Passive immunotherapy as defined herein is the passive transfer of antibody to a recipient (patient). Active immunization is the induction of antibody and/or T-cell responses in a recipient (patient). Induction of an immune response is the result of providing the recipient with an antigen to which antibodies are raised. As appreciated by one of ordinary skill in the

art, the antigen may be provided by injecting a polypeptide against which antibodies are desired to be raised into a recipient, or contacting the recipient with a nucleic acid capable of expressing the antigen and under conditions for expression of the antigen, leading to an immune response.

In a preferred embodiment the prostate cancer proteins against which antibodies are raised are secreted proteins as described above. Without being bound by theory, antibodies used for treatment, bind and prevent the secreted protein from binding to its receptor, thereby inactivating the secreted prostate cancer protein.

In another preferred embodiment, the prostate cancer protein to which antibodies are raised is a transmembrane protein. Without being bound by theory, antibodies used for treatment bind the extracellular domain of the prostate cancer protein and prevent it from binding to other proteins, such as circulating ligands or cell-associated molecules. The antibody may cause down-regulation of the transmembrane prostate cancer protein. As will be appreciated by one of ordinary skill in the art, the antibody may be a competitive, non-competitive or uncompetitive inhibitor of protein binding to the extracellular domain of the prostate cancer protein. The antibody is also often an antagonist of the prostate cancer protein. Further, the antibody may prevent activation of the transmembrane prostate cancer protein. In one aspect, when the antibody prevents the binding of other molecules to the prostate cancer protein, the antibody prevents growth of the cell. The antibody may also be used to target or sensitize the cell to cytotoxic agents, including, but not limited to TNF-α, TNF-β, IL-1, INF-γ, and IL-2, or chemotherapeutic agents including 5FU, vinblastine, actinomycin D, cisplatin, methotrexate, and the like. In some instances the antibody belongs to a sub-type that activates serum complement when complexed with the transmembrane protein thereby mediating cytotoxicity or antigen-dependent cytotoxicity (ADCC). Thus, prostate cancer is treated by administering to a patient antibodies directed against the transmembrane prostate cancer protein. Antibody-labeling may activate a co-toxin, localize a toxin payload, or otherwise provide means to locally ablate cells.

In another preferred embodiment, the antibody is conjugated to an effector moiety. The effector moiety can be a labeling moiety such as a radioactive label or fluorescent label, or can be a therapeutic moiety. In one aspect the therapeutic moiety is a small molecule that modulates the activity of the prostate cancer protein. In another aspect the therapeutic moiety modulates the activity of molecules associated with or in close proximity to the prostate

cancer protein. The therapeutic moiety may inhibit enzymatic activity such as protease or collagenase or protein kinase activity associated with prostate cancer.

In a preferred embodiment, the therapeutic moiety can also be a cytotoxic agent. In this method, targeting the cytotoxic agent to prostate cancer tissue or cells, results in a reduction in the number of afflicted cells, thereby reducing symptoms associated with prostate cancer. Cytotoxic agents are numerous and varied and include, but are not limited to, cytotoxic drugs or toxins or active fragments of such toxins. Suitable toxins and their corresponding fragments include diphtheria A chain, exotoxin A chain, ricin A chain, abrin A chain, curcin, crotin, phenomycin, enomycin, saporin, auristatin, and the like. Cytotoxic agents also include radiochemicals made by conjugating radioisotopes to antibodies raised against prostate cancer proteins, or binding of a radionuclide to a chelating agent that has been covalently attached to the antibody. Targeting the therapeutic moiety to transmembrane prostate cancer proteins not only serves to increase the local concentration of therapeutic moiety in the prostate cancer afflicted area, but also serves to reduce deleterious side effects, e.g., by binding to normal tissues, that may be associated with the therapeutic moiety.

In another preferred embodiment, the prostate cancer protein against which the antibodies are raised is an intracellular protein. In this case, the antibody may be conjugated to a protein which facilitates entry into the cell. In one case, the antibody enters the cell by endocytosis. In another embodiment, a nucleic acid encoding the antibody is administered to the individual or cell. Moreover, wherein the prostate cancer protein can be targeted within a cell, i.e., the nucleus, an antibody thereto contains a signal for that target localization, i.e., a nuclear localization signal.

The prostate cancer antibodies of the invention specifically bind to prostate cancer proteins. By "specifically bind" herein is meant that the antibodies bind to the protein with a K_d of at least about 0.1 mM, more usually at least about 1 μM, preferably at least about 0.1 μM or better, and most preferably, 0.01 μM or better. Selectivity of binding is also important.

Detection of prostate cancer sequence for diagnostic and therapeutic applications

In one aspect, the RNA expression levels of genes are determined for different cellular states in the prostate cancer phenotype. After androgen ablation therapy, cells that survive the therapy undergo a period of quiescence followed at sometime later by active cell

division. As explained above, there are a variety of expression patterns characteristic of the prostate cancer genes involved in androgen-independent prostate cancer. Some genes are expressed early in the time course following ablation therapy, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-hi pattern in 1A). Other genes are expressed early in the time course following ablation therapy, then drop off in expression, and do not express again with emergence of androgen-independence (hi-lo-lo pattern in Table 1A). Still other genes are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-hi pattern in Table 1A). Other genes are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-hi-hi pattern in Table 1A). Finally, some genes are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-hi-lo pattern in Table 1A). Thus, the data suggest that different antigens are expressed in quiescent cells and actively dividing androgen-independent prostate cancer cells.

In another aspect, the RNA expression levels of genes are determined for different cellular states in the prostate cancer phenotype. After androgen ablation therapy, cells that survive the therapy undergo a period of quiescence followed at sometime later by active cell division. As explained above, there are a variety of expression patterns characteristic of the prostate cancer genes involved in androgen-independent prostate cancer. Some genes are expressed early in the time course following ablation therapy, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-lo-hi pattern in Table 2A). Other genes are expressed early in the time course following ablation therapy, then drop off in expression, and do not express again with emergence of androgen-independence (hi-lo-lo-lo and hi-hi-lo-lo pattern in Table 2A). Still other genes are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-lo-hi pattern in Table 2A). Other genes are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-lo-hi-hi pattern in Table 2A). Finally, some genes are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-lo-hi-lo pattern in Table 2A). Thus, the data suggest that different antigens are expressed in quiescent cells (during androgen withdrawal) and actively dividing androgen-independent prostate cancer cells.

Effective therapy to combat androgen-independent prostate cancer requires that the timing of therapy coincide with expression of the target genes. Patients can be monitored for the expression of certain diagnostic antigens that indicate the presence of quiescent cells or which indicate the transition to actively dividing androgen-independent prostate cancer cells. Thus, therapy to combat androgen-independent prostate cancer should begin at some time following androgen ablation therapy, depending on the particular target. Typically the transition from quiescence to actively dividing androgen-independent prostate cancer occurs between 6-24 months following androgen ablation therapy. Thus, preferred time periods for the therapies of the invention are as follows:

Expression levels of genes in normal tissue (i.e., not undergoing prostate cancer) and in prostate cancer tissue (and in some cases, for varying severities of prostate cancer that relate to prognosis, as outlined below) or in non-malignant disease are evaluated to provide expression profiles. An expression profile of a particular cell state or point of development is essentially a "fingerprint" of the state. While two states may have a particular gene similarly expressed, the evaluation of a number of genes simultaneously allows the generation of a gene expression profile that is reflective of the state of the cell. By comparing expression profiles of cells in different states, information regarding which genes are important (including both up- and down-regulation of genes) in each of these states is obtained. Then, diagnosis may be performed or confirmed to determine whether a tissue sample has the gene expression profile of normal or cancerous tissue. This will provide for molecular diagnosis of related conditions.

"Differential expression," or grammatical equivalents as used herein, refers to qualitative or quantitative differences in the temporal and/or cellular gene expression patterns within and among cells and tissue. Thus, a differentially expressed gene can qualitatively have its expression altered, including an activation or inactivation, in, e.g., normal versus prostate cancer tissue. Genes may be turned on or turned off in a particular state, relative to another state thus permitting comparison of two or more states. A qualitatively regulated gene will exhibit an expression pattern within a state or cell type which is detectable by standard techniques. Some genes will be expressed in one state or cell type, but not in both. Alternatively, the difference in expression may be quantitative, e.g., in that expression is increased or decreased; i.e., gene expression is either upregulated, resulting in an increased amount of transcript, or downregulated, resulting in a decreased amount of transcript. The

degree to which expression differs need only be large enough to quantify via standard characterization techniques as outlined below, such as by use of Affymetrix GeneChip™ expression arrays, Lockhart (1996) Nature Biotechnology 14:1675-1680, hereby expressly incorporated by reference. Other techniques include, but are not limited to, quantitative reverse transcriptase PCR, northern analysis and RNase protection. As outlined above, preferably the change in expression (i.e., upregulation or downregulation) is at least about 50%, more preferably at least about 100%, more preferably at least about 150%, more preferably at least about 200%, with from 300 to at least 1000% being especially preferred.

Evaluation may be at the gene transcript, or the protein level. The amount of gene expression may be monitored using nucleic acid probes to the DNA or RNA equivalent of the gene transcript, and the quantification of gene expression levels, or, alternatively, the final gene product itself (protein) can be monitored, e.g., with antibodies to the prostate cancer protein and standard immunoassays (ELISAs, etc.) or other techniques, including mass spectroscopy assays, 2D gel electrophoresis assays, etc. Proteins corresponding to prostate cancer genes, i.e., those identified as being important in a prostate cancer or disease phenotype, can be evaluated in a prostate cancer diagnostic test.

In a preferred embodiment, gene expression monitoring is performed simultaneously on a number of genes. Multiple protein expression monitoring can be performed as well. Similarly, these assays may be performed on an individual basis as well.

In this embodiment, the prostate cancer nucleic acid probes are attached to biochips as outlined herein for the detection and quantification of prostate cancer sequences in a particular cell. The assays are further described below in the example. PCR techniques can be used to provide greater sensitivity.

In a preferred embodiment nucleic acids encoding the prostate cancer protein are detected. Although DNA or RNA encoding the prostate cancer protein may be detected, of particular interest are methods wherein an mRNA encoding a prostate cancer protein is detected. Probes to detect mRNA can be a nucleotide/deoxynucleotide probe that is complementary to and hybridizes with the mRNA and includes, but is not limited to, oligonucleotides, cDNA, or RNA. Probes also should contain a detectable label, as defined herein. In one method the mRNA is detected after immobilizing the nucleic acid to be examined on a solid support such as nylon membranes and hybridizing the probe with the sample. Following washing to remove the non-specifically bound probe, the label is

detected. In another method detection of the mRNA is performed in situ (in situ hybridization or ISH). In this method permeabilized cells or tissue samples are contacted with a detectably labeled nucleic acid probe for sufficient time to allow the probe to hybridize with the target mRNA. Following washing to remove the non-specifically bound probe, the label is detected. For example a digoxygenin labeled riboprobe (RNA probe) that is complementary to the mRNA encoding a prostate cancer protein is detected by binding the digoxygenin with an anti-digoxygenin secondary antibody and developed with nitro blue tetrazolium and 5-bromo-4-chloro-3-indoyl phosphate.

In a preferred embodiment, various proteins from the three classes of proteins as described herein (secreted, transmembrane, or intracellular proteins) are used in diagnostic assays. The prostate cancer proteins, antibodies, nucleic acids, modified proteins and cells containing prostate cancer sequences are used in diagnostic assays. Such may evaluate tissues, e.g., immunohistochemistry, or evaluate body fluids, e.g., blood. The detection may be direct of cells, or indirect, e.g., of products from cells. This can be performed on an individual gene or corresponding polypeptide level. In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes and/or corresponding polypeptides.

As described and defined herein, prostate cancer proteins, including intracellular, transmembrane, or secreted proteins, find use as prognostic or diagnostic markers of prostate cancer or other prostate conditions. Detection of these proteins in putative prostate cancer tissue allows for detection, diagnosis, or prognosis of prostate proliferative disorders (malignant and non-malignant) including benign prostate hyperplasia (BPH) and cancer, and prostatitis. Diagnosis may also assist in selecting a therapeutic strategy, e.g., based on expression profiles and/or comparison to archival samples. In one embodiment, antibodies are used to detect prostate cancer proteins, directly or indirectly. A preferred method separates proteins from a sample by electrophoresis on a gel (typically a denaturing and reducing protein gel, but may be another type of gel, including isoelectric focusing gels and the like). Following separation of proteins, the prostate cancer protein is detected, e.g., by immunoblotting with antibodies raised against the prostate cancer protein. Methods of immunoblotting are well known to those of ordinary skill in the art.

In another preferred method, antibodies to the prostate cancer protein find use in in situ imaging techniques, e.g., in histology and/or in immunohistochemistry (e.g., Asai (ed. 1993) Methods in Cell Biology: Antibodies in Cell Biology (vol. 37) Academic Press. In this method cells are contacted with from one to many antibodies to the prostate cancer protein(s). Following washing to remove non-specific antibody binding, the presence of the antibody or antibodies is detected. In one embodiment the antibody is detected by incubating with a secondary antibody that contains a detectable label. In another method the primary antibody to the prostate cancer protein(s) contains a detectable label, e.g., an enzyme marker that can act on a substrate. In another preferred embodiment each one of multiple primary antibodies contains a distinct and detectable label. This method finds particular use in simultaneous screening for a plurality of prostate cancer proteins. As will be appreciated by one of ordinary skill in the art, many other histological imaging techniques are also provided by the invention.

In a preferred embodiment the label is detected in a fluorometer which has the ability to detect and distinguish emissions of different wavelengths. In addition, a fluorescence activated cell sorter (FACS) can be used in the method.

In another preferred embodiment, antibodies find use in diagnosing prostate cancer from blood, serum, plasma, stool, and other samples. Such samples, therefore, are useful as samples to be probed or tested for the presence of prostate cancer proteins, which may be diagnostic of prostate conditions beyond cancer, e.g., BPH. Antibodies can be used to detect a prostate cancer protein by previously described immunoassay techniques including ELISA, immunoblotting (western blotting), immunoprecipitation, BIACORE technology, and the like. Conversely, the presence of antibodies may indicate an immune response against an endogenous prostate cancer protein.

In a preferred embodiment, in situ hybridization of labeled prostate cancer nucleic acid probes to tissue arrays is done. For example, arrays of tissue samples, including prostate cancer tissue and/or normal tissue, are made. In situ hybridization (see, e.g., Ausubel, supra) is then performed. When comparing the fingerprints between an individual and a standard, the skilled artisan can make a diagnosis, a prognosis, or a prediction based on the findings. It is further understood that the genes which indicate the diagnosis may differ from those which indicate the prognosis and molecular profiling of the condition of the cells may lead to distinctions between responsive or refractory conditions or may be predictive of outcomes.

In a preferred embodiment, the prostate cancer proteins, antibodies, nucleic acids, modified proteins, and cells containing prostate cancer sequences are used in prognosis assays. As above, gene expression profiles can be generated that correlate to prostate cancer or other prostate disorders, in terms of useful aspects of clinical condition, pathology, or other information which may be relevant to long term prognosis. Again, this may be done on either a protein or gene level, with the use of genes being preferred. Single or multiple genes may be useful in various combinations. As above, prostate cancer probes may be attached to biochips for the detection and quantification of prostate cancer sequences in a tissue or patient. The assays proceed as outlined above for diagnosis. PCR method may provide more sensitive and accurate quantification.

Assays for therapeutic compounds

In a preferred embodiment members of the proteins, nucleic acids, and antibodies as described herein are used in drug screening assays. The prostate cancer proteins, antibodies, nucleic acids, modified proteins, and cells containing prostate cancer sequences are used in drug screening assays or by evaluating the effect of drug candidates on a "gene expression profile" or expression profile of polypeptides. In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes after treatment with a candidate agent (e.g., Zlokarnik, et al. (1998) Science 279:84-88; Heid (1996) Genome Res. 6:986-94).

In a preferred embodiment, the prostate cancer proteins, antibodies, nucleic acids, modified proteins, and cells containing the native or modified prostate cancer proteins are used in screening assays. That is, the present invention provides novel methods for screening for compositions which modulate the prostate cancer phenotype or an identified physiological function of a prostate cancer protein. As above, this can be done on an individual gene level or by evaluating the effect of drug candidates on a "gene expression profile". In a preferred embodiment, the expression profiles are used, preferably in conjunction with high throughput screening techniques to allow monitoring for expression profile genes after treatment with a candidate agent, see Zlokarnik, supra.

Having identified the differentially expressed genes herein, a variety of assays may be executed. In a preferred embodiment, assays may be run on an individual gene or protein level. That is, having identified a particular gene as up regulated in prostate cancer, test

compounds can be screened for the ability to modulate gene expression or for binding to the prostate cancer protein. "Modulation" thus includes both an increase and a decrease in gene expression. The preferred amount of modulation will depend on the original change of the gene expression in normal versus tissue undergoing prostate cancer, with changes of at least 10%, preferably 50%, more preferably 100-300%, and in some embodiments 300-1000% or greater. Thus, if a gene exhibits a 4-fold increase in prostate cancer tissue compared to normal tissue, a decrease of about four-fold is often desired; similarly, a 10-fold decrease in prostate cancer tissue compared to normal tissue often provides a target value of a 10-fold increase in expression to be induced by the test compound.

The amount of gene expression may be monitored using nucleic acid probes and the quantification of gene expression levels, or, alternatively, the gene product itself can be monitored, e.g., through the use of antibodies to the prostate cancer protein and standard immunoassays. Proteomics and separation techniques may also allow quantification of expression.

In a preferred embodiment, gene expression or protein monitoring of a number of entities, i.e., an expression profile, is monitored simultaneously. Such profiles will typically involve a plurality of those entities described herein.

In this embodiment, the prostate cancer nucleic acid probes are attached to biochips as outlined herein for the detection and quantification of prostate cancer sequences in a particular cell. Alternatively, PCR may be used. Thus, a series, e.g., of microtiter plate, may be used with dispensed primers in desired wells. A PCR reaction can then be performed and analyzed for each well.

Expression monitoring can be performed to identify compounds that modify the expression of one or more prostate cancer-associated sequences, e.g., a polynucleotide sequence set out in Tables 1A-4. Generally, in a preferred embodiment, a test modulator is added to the cells prior to analysis. Moreover, screens are also provided to identify agents that modulate prostate cancer, modulate prostate cancer proteins, bind to a prostate cancer protein, or interfere with the binding of a prostate cancer protein and an antibody or other binding partner.

The term "test compound" or "drug candidate" or "modulator" or grammatical equivalents as used herein describes a molecule, e.g., protein, oligopeptide, small organic molecule, polysaccharide, polynucleotide, etc., to be tested for the capacity to directly or

indirectly alter the prostate cancer phenotype or the expression of a prostate cancer sequence, e.g., a nucleic acid or protein sequence. In preferred embodiments, modulators alter expression profiles, or expression profile nucleic acids or proteins provided herein. In one embodiment, the modulator suppresses a prostate cancer phenotype, e.g., to a normal or non-malignant tissue fingerprint. In another embodiment, a modulator induced a prostate cancer phenotype. Generally, a plurality of assay mixtures are run in parallel with different agent concentrations to obtain a differential response to the various concentrations. Typically, one of these concentrations serves as a negative control, i.e., at zero concentration or below the level of detection.

Drug candidates encompass numerous chemical classes, though typically they are organic molecules, preferably small organic compounds having a molecular weight of more than 100 and less than about 2,500 daltons. Preferred small molecules are less than 2000, or less than 1500, or less than 1000, or less than 500 D. Candidate agents comprise functional groups necessary for structural interaction with proteins, particularly hydrogen bonding, and typically include at least an amine, carbonyl, hydroxyl or carboxyl group, preferably at least two of the functional chemical groups. The candidate agents often comprise cyclical carbon or heterocyclic structures and/or aromatic or polyaromatic structures substituted with one or more of the above functional groups. Candidate agents are also found among biomolecules including peptides, saccharides, fatty acids, steroids, purines, pyrimidines, derivatives, structural analogs, or combinations thereof. Particularly preferred are peptides.

In one aspect, a modulator will neutralize the effect of a prostate cancer protein. By "neutralize" is meant that activity of a protein is inhibited or blocked and the consequent effect on the cell.

In certain embodiments, combinatorial libraries of potential modulators will be screened for an ability to bind to a prostate cancer polypeptide or to modulate activity. Conventionally, new chemical entities with useful properties are generated by identifying a chemical compound (called a "lead compound") with some desirable property or activity, e.g., inhibiting activity, creating variants of the lead compound, and evaluating the property and activity of those variant compounds. Often, high throughput screening (HTS) methods are employed for such an analysis.

In one preferred embodiment, high throughput screening methods involve providing a library containing a large number of potential therapeutic compounds (candidate

compounds). Such "combinatorial chemical libraries" are then screened in one or more assays to identify those library members (particular chemical species or subclasses) that display a desired characteristic activity. The compounds thus identified can serve as conventional "lead compounds" or can themselves be used as potential or actual therapeutics.

A combinatorial chemical library is a collection of diverse chemical compounds generated by either chemical synthesis or biological synthesis by combining a number of chemical "building blocks" such as reagents. For example, a linear combinatorial chemical library, such as a polypeptide (e.g., mutein) library, is formed by combining a set of chemical building blocks called amino acids in most every possible way for a given compound length (i.e., the number of amino acids in a polypeptide compound). Millions of chemical compounds can be synthesized through such combinatorial mixing of chemical building blocks. Gallop, et al. (1994) J. Med. Chem. 37:1233-1251.

Preparation and screening of combinatorial chemical libraries is well known to those of skill in the art. Such combinatorial chemical libraries include, but are not limited to, peptide libraries (see, e.g., U.S. Patent No. 5,010,175, Furka (1991) Pept. Prot. Res. 37:487-493, Houghton, et al. (1991) Nature, 354:84-88), peptoids (PCT Publication No WO 91/19735), encoded peptides (PCT Publication WO 93/20242), random bio-oligomers (PCT Publication WO 92/00091), benzodiazepines (U.S. Pat. No. 5,288,514), diversomers such as hydantoins, benzodiazepines and dipeptides (Hobbs, et al. (1993) Proc. Nat. Acad. Sci. USA 90:6909-6913), vinylogous polypeptides (Hagihara, et al. (1992) J. Amer. Chem. Soc. 114:6568-xxx), nonpeptidal peptidomimetics with a Beta-D-Glucose scaffolding (Hirschmann, et al. (1992) J. Amer. Chem. Soc. 114:9217-9218), analogous organic syntheses of small compound libraries (Chen, et al. (1994) J. Amer. Chem. Soc. 116:2661-xxx), oligocarbamates (Cho, et al. (1993) Science 261:1303-1305), and/or peptidyl phosphonates (Campbell, et al. (1994) J. Org. Chem. 59:658-xxx). See, generally, Gordon, et al. (1994) J. Med. Chem. 37:1385-1401), nucleic acid libraries (see, e.g., Stratagene, Corp.), peptide nucleic acid libraries (see, e.g., U.S. Patent 5,539,083), antibody libraries (see, e.g., Vaughn, et al. (1996) Nature Biotechnology 14:309-314, and PCT/US96/10287), carbohydrate libraries (see, e.g., Liang, et al. (1996) Science 274:1520-1522, and U.S. Patent No. 5,593,853), and small organic molecule libraries (see, e.g., benzodiazepines, Baum (1993) C&EN, Jan 18, page 33; isoprenoids, U.S. Patent No. 5,569,588; thiazolidinones and metathiazanones, U.S. Patent No. 5,549,974; pyrrolidines, U.S. Patent Nos. 5,525,735 and

5,519,134; morpholino compounds, U.S. Patent No. 5,506,337; benzodiazepines, U.S. Patent No. 5,288,514; and the like).

Devices for the preparation of combinatorial libraries are commercially available (see, e.g., 357 MPS, 390 MPS, Advanced Chem Tech, Louisville KY, Symphony, Rainin, Woburn, MA, 433A Applied Biosystems, Foster City, CA, 9050 Plus, Millipore, Bedford, MA).

A number of well known robotic systems have also been developed for solution phase chemistries. These systems include automated workstations like the automated synthesis apparatus developed by Takeda Chemical Industries, LTD. (Osaka, Japan) and many robotic systems utilizing robotic arms (Zymate II, Zymark Corporation, Hopkinton, Mass.; Orca, Hewlett-Packard, Palo Alto, Calif.), which mimic the manual synthetic operations performed by a chemist. Many of the above devices are suitable for use with the present invention. The nature and implementation of modifications to these devices (if any) so that they can operate as discussed herein will be apparent to persons skilled in the relevant art. In addition, numerous combinatorial libraries are themselves commercially available (see, e.g., ComGenex, Princeton, N.J., Asinex, Moscow, Ru, Tripos, Inc., St. Louis, MO, ChemStar, Ltd, Moscow, RU, 3D Pharmaceuticals, Exton, PA, Martek Biosciences, Columbia, MD, etc.).

The assays to identify modulators are amenable to high throughput screening. Preferred assays thus detect enhancement or inhibition of prostate cancer gene transcription, inhibition or enhancement of polypeptide expression, and inhibition or enhancement of polypeptide activity.

High throughput assays for the presence, absence, quantification, or other properties of particular nucleic acids or protein products are well known to those of skill in the art. Similarly, binding assays and reporter gene assays are similarly well known. Thus, e.g., U.S. Patent No. 5,559,410 discloses high throughput screening methods for proteins, U.S. Patent No. 5,585,639 discloses high throughput screening methods for nucleic acid binding (i.e., in arrays), while U.S. Patent Nos. 5,576,220 and 5,541,061 disclose high throughput methods of screening for ligand/antibody binding.

In addition, high throughput screening systems are commercially available (see, e.g., Zymark Corp., Hopkinton, MA; Air Technical Industries, Mentor, OH; Beckman Instruments, Inc. Fullerton, CA; Precision Systems, Inc., Natick, MA, etc.). These systems

typically automate entire procedures, including sample and reagent pipetting, liquid dispensing, timed incubations, and final readings of the microplate in detector(s) appropriate for the assay. These configurable systems provide high throughput and rapid start up as well as a high degree of flexibility and customization. The manufacturers of such systems provide detailed protocols for various high throughput systems. Thus, e.g., Zymark Corp. provides technical bulletins describing screening systems for detecting the modulation of gene transcription, ligand binding, and the like.

In one embodiment, modulators are proteins, often naturally occurring proteins or fragments of naturally occurring proteins. Thus, e.g., cellular extracts containing proteins, or random or directed digests of proteinaceous cellular extracts, may be used. In this way libraries of proteins may be made for screening in the methods of the invention. Particularly preferred in this embodiment are libraries of bacterial, fungal, viral, and mammalian proteins, with the latter being preferred, and human proteins being especially preferred. Particularly useful test compound will be directed to the class of proteins to which the target belongs, e.g., substrates for enzymes or ligands and receptors.

In a preferred embodiment, modulators are peptides of from about 5 to about 30 amino acids, with from about 5 to about 20 amino acids being preferred, and from about 7 to about 15 being particularly preferred. The peptides may be digests of naturally occurring proteins as is outlined above, random peptides, or "biased" random peptides. By "randomized" or grammatical equivalents herein is meant that each nucleic acid and peptide consists of essentially random nucleotides and amino acids, respectively. Since generally these random peptides (or nucleic acids, discussed below) are chemically synthesized, they may typically incorporate any nucleotide or amino acid at any position. The synthetic process can be designed to generate randomized proteins or nucleic acids, to allow the formation of all or most of the possible combinations over the length of the sequence, thus forming a library of randomized candidate bioactive proteinaceous agents.

In one embodiment, the library is fully randomized, with no sequence preferences or constants at any position. In a preferred embodiment, the library is biased. That is, some positions within the sequence are either held constant, or are selected from a limited number of possibilities. For example, in a preferred embodiment, the nucleotides or amino acid residues are randomized within a defined class, e.g., of hydrophobic amino acids, hydrophilic residues, sterically biased (either small or large) residues, towards the creation of nucleic acid

binding domains, the creation of cysteines, for cross-linking, prolines for SH-3 domains, serines, threonines, tyrosines, or histidines for phosphorylation sites, etc., or to purines, etc.

Modulators of prostate cancer can also be nucleic acids, as defined above.

As described above generally for proteins, nucleic acid modulating agents may be naturally occurring nucleic acids, random nucleic acids, or "biased" random nucleic acids. For example, digests of prokaryotic or eukaryotic genomes may be used as is outlined above for proteins.

In a preferred embodiment, the candidate compounds are organic chemical moieties, a wide variety of which are available in the literature.

After the candidate agent has been added and the cells allowed to incubate for some period of time, the sample containing a target sequence to be analyzed is added to the biochip. If required, the target sequence is prepared using known techniques. For example, the sample may be treated to lyse the cells, using known lysis buffers, electroporation, etc., with purification and/or amplification such as PCR performed as appropriate. For example, an in vitro transcription with labels covalently attached to the nucleotides is performed. Generally, the nucleic acids are labeled with biotin-FITC or PE, or with cy3 or cy5.

In a preferred embodiment, the target sequence is labeled with, e.g., a fluorescent, a chemiluminescent, a chemical, or a radioactive signal, to provide a means of detecting the target sequence's specific binding to a probe. The label also can be an enzyme, such as, alkaline phosphatase or horseradish peroxidase, which when provided with an appropriate substrate produces a product that can be detected. Alternatively, the label can be a labeled compound or small molecule, such as an enzyme inhibitor, that binds but is not catalyzed or altered by the enzyme. The label also can be a moiety or compound, such as, an epitope tag or biotin which specifically binds to streptavidin. For the example of biotin, the streptavidin is labeled as described above, thereby, providing a detectable signal for the bound target sequence. Unbound labeled streptavidin is typically removed prior to analysis.

As will be appreciated by those in the art, these assays can be direct hybridization assays or can comprise "sandwich assays", which include the use of multiple probes, as is generally outlined in U.S. Patent Nos. 5,681,702, 5,597,909, 5,545,730, 5,594,117, 5,591,584, 5,571,670, 5,580,731, 5,571,670, 5,591,584, 5,624,802, 5,635,352, 5,594,118, 5,359,100, 5,124,246, and 5,681,697, each of which is hereby incorporated by reference. In this embodiment, in general, the target nucleic acid is prepared as outlined above, and then

added to the biochip comprising a plurality of nucleic acid probes, under conditions that allow the formation of a hybridization complex.

A variety of hybridization conditions may be used in the present invention, including high, moderate, and low stringency conditions as outlined above. The assays are generally run under stringency conditions which allows formation of the label probe hybridization complex only in the presence of target. Stringency can be controlled by altering a step parameter that is a thermodynamic variable, including, but not limited to, temperature, formamide concentration, salt concentration, chaotropic salt concentration pH, organic solvent concentration, etc.

These parameters may also be used to control non-specific binding, as is generally outlined in U.S. Patent No. 5,681,697. Thus it may be desirable to perform certain steps at higher stringency conditions to reduce non-specific binding.

The reactions outlined herein may be accomplished in a variety of ways. Components of the reaction may be added simultaneously, or sequentially, in different orders, with preferred embodiments outlined below. In addition, the reaction may include a variety of other reagents. These include salts, buffers, neutral proteins, e.g., albumin, detergents, etc., which may be used to facilitate optimal hybridization and detection, and/or reduce non-specific or background interactions. Reagents that otherwise improve the efficiency of the assay, such as protease inhibitors, nuclease inhibitors, anti-microbial agents, etc., may also be used as appropriate, depending on the sample preparation methods and purity of the target.

The assay data are analyzed to determine the expression levels, and changes in expression levels as between states, of individual genes, forming a gene expression profile.

Screens are performed to identify modulators of the prostate cancer or related phenotype. In one embodiment, screening is performed to identify modulators that can induce or suppress a particular expression profile, thus preferably generating the associated phenotype. In another embodiment, e.g., for diagnostic applications, having identified differentially expressed genes important in a particular state, screens can be performed to identify modulators that alter expression of individual genes. In an another embodiment, screening is performed to identify modulators that alter a biological function of the expression product of a differentially expressed gene. Again, having identified the importance of a gene in a particular state, screens are performed to identify agents that bind and/or modulate the biological activity of the gene product.

In addition screens can be done for genes that are induced in response to a candidate agent. After identifying a modulator based upon its ability to suppress a prostate cancer expression pattern leading to a normal expression pattern, or to modulate a single prostate cancer gene expression profile so as to mimic the expression of the gene from normal tissue, a screen as described above can be performed to identify genes that are specifically modulated in response to the agent. Comparing expression profiles between normal tissue and agent treated prostate cancer tissue reveals genes that are not expressed in normal tissue or prostate cancer tissue, but are expressed in agent treated tissue. These agent-specific sequences can be identified and used by methods described herein for prostate cancer genes or proteins. In particular these sequences and the proteins they encode find use in marking or identifying agent treated cells. In addition, antibodies can be raised against the agent induced proteins and used to target novel therapeutics to the treated prostate cancer tissue sample.

Thus, in one embodiment, a test compound is administered to a population of prostate cancer cells, that have an associated prostate cancer expression profile. By "administration" or "contacting" herein is meant that the candidate agent is added to the cells in such a manner as to allow the agent to act upon the cell, whether by uptake and intracellular action, or by action at the cell surface. In some embodiments, nucleic acid encoding a proteinaceous candidate agent (e.g., a peptide) may be put into a viral construct such as an adenoviral or retroviral construct, and added to the cell, such that expression of the peptide agent is accomplished, e.g., PCT US97/01019. Regulatable gene therapy systems can also be used.

Once the test compound has been administered to the cells, the cells can be washed if desired and are allowed to incubate under preferably physiological conditions for some period of time. The cells are then harvested and a new gene expression profile is generated, as outlined herein.

Thus, e.g., prostate cancer or non-malignant tissue may be screened for agents that modulate, e.g., induce or suppress the prostate cancer or related phenotype. A change in at least one gene, preferably many, of the expression profile indicates that the agent has an effect on prostate cancer activity. By defining such a signature for the prostate cancer phenotype, screens for new drugs that alter the phenotype can be devised. With this approach, the drug target need not be known and need not be represented in the original expression screening platform, nor does the level of transcript for the target protein need to change.

In a preferred embodiment, as outlined above, screens may be done on individual genes and gene products (proteins). That is, having identified a particular differentially expressed gene as important in a particular state, screening of modulators of either the expression of the gene or the gene product itself can be done. The gene products of differentially expressed genes are sometimes referred to herein as "prostate cancer proteins" or a "prostate cancer modulatory protein". The prostate cancer modulatory protein may be a fragment, or alternatively, be the full length protein to the fragment encoded by the nucleic acids of the Tables 1A-4. Preferably, the prostate cancer modulatory protein is a fragment. In a preferred embodiment, the prostate cancer amino acid sequence which is used to determine sequence identity or similarity is encoded by a nucleic acid of Tables 1A-4. In another embodiment, the sequences are naturally occurring allelic variants of a protein encoded by a nucleic acid of Tables 1A-4. In another embodiment, the sequences are sequence variants as further described herein.

Preferably, the prostate cancer modulatory protein is a fragment of approximately 14 to 24 amino acids long. More preferably the fragment is a soluble fragment. Preferably, the fragment includes a non-transmembrane region. In a preferred embodiment, the fragment has an N-terminal Cys to aid in solubility. In one embodiment, the C-terminus of the fragment is kept as a free acid and the N-terminus is a free amine to aid in coupling, i.e., to cysteine.

In one embodiment the prostate cancer proteins are conjugated to an immunogenic agent as discussed herein. In one embodiment the prostate cancer protein is conjugated to BSA.

Measurements of prostate cancer polypeptide activity, or of prostate cancer or the prostate cancer phenotype can be performed using a variety of assays. For example, the effects of the test compounds upon the function of the prostate cancer polypeptides can be measured by examining parameters described above. A suitable physiological change that affects activity can be used to assess the influence of a test compound on the polypeptides of this invention. When the functional consequences are determined using intact cells or animals, one can also measure a variety of effects such as, in the case of prostate cancer associated with tumors, tumor growth, tumor metastasis, neovascularization, hormone release, transcriptional changes to both known and uncharacterized genetic markers (e.g., northern blots), changes in cell metabolism such as cell growth or pH changes, and changes

in intracellular second messengers such as cGMP. In the assays of the invention, a mammalian prostate cancer polypeptide is typically used, e.g., mouse, preferably human.

Assays to identify compounds with modulating activity can be performed in vitro. For example, a prostate cancer polypeptide is first contacted with a potential modulator and incubated for a suitable amount of time, e.g., from 0.5 to 48 hours. In one embodiment, the prostate cancer polypeptide levels are determined in vitro by measuring the level of protein or mRNA. The level of protein is measured using immunoassays such as western blotting, ELISA, and the like with an antibody that selectively binds to the prostate cancer polypeptide or a fragment thereof. For measurement of mRNA, amplification, e.g., using PCR, LCR, or hybridization assays, e.g., northern hybridization, RNAse protection, dot blotting, are preferred. The level of protein or mRNA is detected using directly or indirectly labeled detection agents, e.g., fluorescently or radioactively labeled nucleic acids, radioactively or enzymatically labeled antibodies, and the like, as described herein.

Alternatively, a reporter gene system can be devised using the prostate cancer protein promoter operably linked to a reporter gene such as luciferase, green fluorescent protein, CAT, or β-gal. The reporter construct is typically transfected into a cell. After treatment with a potential modulator, the amount of reporter gene transcription, translation, or activity is measured according to standard techniques known to those of skill in the art.

In a preferred embodiment, as outlined above, screens may be done on individual genes and gene products (proteins). That is, having identified a particular differentially expressed gene as important in a particular state, screening of modulators of the expression of the gene or the gene product itself can be done. The gene products of differentially expressed genes are sometimes referred to herein as "prostate cancer proteins." The prostate cancer protein may be a fragment, or alternatively, be the full length protein corresponding to a fragment shown herein.

In one embodiment, screening for modulators of expression of specific genes is performed. Typically, the expression of only one or a few genes are evaluated. In another embodiment, screens are designed to first find compounds that bind to differentially expressed proteins. These compounds are then evaluated for the ability to modulate differentially expressed activity. Moreover, once initial candidate compounds are identified, variants can be further screened to better evaluate structure activity relationships.

In a preferred embodiment, binding assays are done. In general, purified or isolated gene product is used; that is, the gene products of one or more differentially expressed nucleic acids are made. For example, antibodies are generated to the protein gene products, and standard immunoassays are run to determine the amount of protein present. Alternatively, cells comprising the prostate cancer proteins can be used in the assays.

Thus, in a preferred embodiment, the methods comprise combining a prostate cancer protein and a candidate compound, and determining the binding of the compound to the prostate cancer protein. Preferred embodiments utilize the human prostate cancer protein, although other mammalian proteins may also be used, e.g., for the development of animal models of human disease. In some embodiments, as outlined herein, variant or derivative prostate cancer proteins may be used.

Generally, in a preferred embodiment of the methods herein, the prostate cancer protein or the candidate agent is non-diffusably bound to an insoluble support having isolated sample receiving areas (e.g., a microtiter plate, an array, etc.). The insoluble supports may be made of a composition to which the compositions can be bound, is readily separated from soluble material, and is otherwise compatible with the overall method of screening. The surface of such supports may be solid or porous and of a convenient shape. Examples of suitable insoluble supports include microtiter plates, arrays, membranes, and beads. These are typically made of glass, plastic (e.g., polystyrene), polysaccharides, nylon or nitrocellulose, teflon™, etc. Microtiter plates and arrays are especially convenient because a large number of assays can be carried out simultaneously, using small amounts of reagents and samples. The particular manner of binding of the composition should be compatible with the reagents and overall methods of the invention, maintain the activity of the composition, and be nondiffusable. Preferred methods of binding include the use of antibodies (which do not sterically block either the ligand binding site or activation sequence when the protein is bound to the support), direct binding to "sticky" or ionic supports, chemical crosslinking, the synthesis of the protein or agent on the surface, etc. Following binding of the protein or agent, excess unbound material is removed by washing. The sample receiving areas may then be blocked through incubation with bovine serum albumin (BSA), casein, or other innocuous protein or other moiety.

In a preferred embodiment, the prostate cancer protein is bound to the support, and a test compound is added to the assay. Alternatively, the candidate agent is bound to the

support and the prostate cancer protein is added. Novel binding agents include specific antibodies, non-natural binding agents identified in screens of chemical libraries, peptide analogs, etc. Of particular interest are screening assays for agents that have a low toxicity for human cells. A wide variety of assays may be used for this purpose, including labeled in vitro protein-protein binding assays, electrophoretic mobility shift assays, immunoassays for protein binding, functional assays (phosphorylation assays, etc.) and the like.

The determination of the binding of the test modulating compound to the prostate cancer protein may be done in a number of ways. In a preferred embodiment, the compound is labeled, and binding determined directly, e.g., by attaching all or a portion of the prostate cancer protein to a solid support, adding a labeled candidate agent (e.g., a fluorescent label), washing off excess reagent, and determining whether the label is present on the solid support. Various blocking and washing steps may be utilized as appropriate.

In some embodiments, only one of the components is labeled, e.g., the proteins (or proteinaceous candidate compounds) can be labeled. Alternatively, more than one component can be labeled with different labels, e.g., ^{125}I for the proteins and a fluorophor for the compound. Proximity reagents, e.g., quenching or energy transfer reagents are also useful.

In one embodiment, the binding of the test compound is determined by competitive binding assay. The competitor is a binding moiety known to bind to the target molecule (i.e., a prostate cancer protein), such as an antibody, peptide, binding partner, ligand, etc. Under certain circumstances, there may be competitive binding between the compound and the binding moiety, with the binding moiety displacing the compound. In one embodiment, the test compound is labeled. Either the compound, or the competitor, or both, is added first to the protein for a time sufficient to allow binding, if present. Incubations may be performed at a temperature which facilitates optimal activity, typically between 4 and 40° C. Incubation periods are typically optimized, e.g., to facilitate rapid high throughput screening. Typically between 0.1 and 1 hour will be sufficient. Excess reagent is generally removed or washed away. The second component is then added, and the presence or absence of the labeled component is followed, to indicate binding.

In a preferred embodiment, the competitor is added first, followed by the test compound. Displacement of the competitor is an indication that the test compound is binding to the prostate cancer protein and thus is capable of binding to, and potentially modulating,

the activity of the prostate cancer protein. In this embodiment, either component can be labeled. Thus, e.g., if the competitor is labeled, the presence of label in the wash solution indicates displacement by the agent. Alternatively, if the test compound is labeled, the presence of the label on the support indicates displacement.

In an alternative embodiment, the test compound is added first, with incubation and washing, followed by the competitor. The absence of binding by the competitor may indicate that the test compound is bound to the prostate cancer protein with a higher affinity. Thus, if the test compound is labeled, the presence of the label on the support, coupled with a lack of competitor binding, may indicate that the test compound is capable of binding to the prostate cancer protein.

In a preferred embodiment, the methods comprise differential screening to identity agents that are capable of modulating the activity of the prostate cancer proteins. In this embodiment, the methods comprise combining a prostate cancer protein and a competitor in a first sample. A second sample comprises a test compound, a prostate cancer protein, and a competitor. The binding of the competitor is determined for both samples, and a change, or difference in binding between the two samples indicates the presence of an agent capable of binding to the prostate cancer protein and potentially modulating its activity. That is, if the binding of the competitor is different in the second sample relative to the first sample, the agent is capable of binding to the prostate cancer protein.

Alternatively, differential screening is used to identify drug candidates that bind to the native prostate cancer protein, but cannot bind to modified prostate cancer proteins. The structure of the prostate cancer protein may be modeled, and used in rational drug design to synthesize agents that interact with that site. Drug candidates that affect the activity of a prostate cancer protein are also identified by screening drugs for the ability to either enhance or reduce the activity of the protein.

Positive controls and negative controls may be used in the assays. Preferably control and test samples are performed in at least triplicate to obtain statistically significant results. Incubation of samples is for a time sufficient for the binding of the agent to the protein. Following incubation, samples are washed free of non-specifically bound material and the amount of bound, generally labeled agent determined. For example, where a radiolabel is employed, the samples may be counted in a scintillation counter to determine the amount of bound compound.

A variety of other reagents may be included in the screening assays. These include reagents like salts, neutral proteins, e.g., albumin, detergents, etc., which may be used to facilitate optimal protein-protein binding and/or reduce non-specific or background interactions. Also reagents that otherwise improve the efficiency of the assay, such as protease inhibitors, nuclease inhibitors, anti-microbial agents, etc., may be used. The mixture of components may be added in an order that provides for the requisite binding.

In a preferred embodiment, the invention provides methods for screening for a compound capable of modulating the activity of a prostate cancer protein. The methods comprise adding a test compound, as defined above, to a cell comprising prostate cancer proteins. Preferred cell types include almost any cell. The cells contain a recombinant nucleic acid that encodes a prostate cancer protein. In a preferred embodiment, a library of candidate agents are tested on a plurality of cells.

In one aspect, the assays are evaluated in the presence or absence or previous or subsequent exposure of physiological signals, e.g., hormones, antibodies, peptides, antigens, cytokines, growth factors, action potentials, pharmacological agents including chemotherapeutics, radiation, carcinogenics, or other cells (e.g., cell-cell contacts). In another example, the determinations are determined at different stages of the cell cycle process.

In this way, compounds that modulate prostate cancer agents are identified. Compounds with pharmacological activity are able to enhance or interfere with the activity of the prostate cancer protein. Once identified, similar structures are evaluated to identify critical structural feature of the compound.

In one embodiment, a method of inhibiting prostate cancer cell division is provided. The method comprises administration of a prostate cancer inhibitor. In another embodiment, a method of inhibiting prostate cancer or other prostate proliferative condition is provided. The method comprises administration of a prostate cancer inhibitor. In a further embodiment, methods of treating cells or individuals with prostate cancer are provided. The method comprises administration of a prostate cancer inhibitor.

In one embodiment, a prostate cancer inhibitor is an antibody as discussed above. In another embodiment, the prostate cancer inhibitor is an antisense molecule.

A variety of cell growth, proliferation, and metastasis assays are known to those of skill in the art, as described below.

Soft agar growth or colony formation in suspension

Normal cells require a solid substrate to attach and grow. When the cells are transformed, they lose this phenotype and grow detached from the substrate. For example, transformed cells can grow in stirred suspension culture or suspended in semi-solid media, such as semi-solid or soft agar. The transformed cells, when transfected with tumor suppressor genes, regenerate normal phenotype and require a solid substrate to attach and grow. Soft agar growth or colony formation in suspension assays can be used to identify modulators of prostate cancer sequences, which when expressed in host cells, inhibit abnormal cellular proliferation and transformation. A therapeutic compound would reduce or eliminate the host cells' ability to grow in stirred suspension culture or suspended in semi-solid media, such as semi-solid or soft.

Techniques for soft agar growth or colony formation in suspension assays are described in Freshney (1994) Culture of Animal Cells a Manual of Basic Technique 3d ed. Wiley-Liss, herein incorporated by reference. See also, the methods section of Garkavtsev, et al. (1996), supra, herein incorporated by reference.

Contact inhibition and density limitation of growth

Normal cells typically grow in a flat and organized pattern in a petri dish until they touch other cells. When the cells touch one another, they are contact inhibited and stop growing. When cells are transformed, however, the cells are not contact inhibited and continue to grow to high densities in disorganized foci. Thus, the transformed cells grow to a higher saturation density than normal cells. This can be detected morphologically by the formation of a disoriented monolayer of cells or rounded cells in foci within the regular pattern of normal surrounding cells. Alternatively, labeling index with (^{3}H)-thymidine at saturation density can be used to measure density limitation of growth. See Freshney (1994), supra. The transformed cells, when transfected with tumor suppressor genes, regenerate a normal phenotype and become contact inhibited and would grow to a lower density.

In this assay, labeling index with (^{3}H)-thymidine at saturation density is a preferred method of measuring density limitation of growth. Transformed host cells are transfected with a prostate cancer-associated sequence and are grown for 24 hours at saturation density in non-limiting medium conditions. The percentage of cells labeling with (^{3}H)-thymidine is determined autoradiographically. See, Freshney (1994), supra.

Growth factor or serum dependence

Transformed cells have a lower serum dependence than their normal counterparts (see, e.g., Temin (1966) J. Natl. Cancer Insti. 37:167-175; Eagle, et al. (1970) J. Exp. Med. 131:836-879); Freshney, supra. This is in part due to release of various growth factors by the transformed cells. Growth factor or serum dependence of transformed host cells can be compared with that of control.

Tumor specific markers levels

Tumor cells release an increased amount of certain factors (hereinafter "tumor specific markers") than their normal counterparts. For example, plasminogen activator (PA) is released from human glioma at a higher level than from normal brain cells (see, e.g., Gullino, "Angiogenesis, tumor vascularization, and potential interference with tumor growth" pp. 178-184 in Mihich (ed. 1985) Biological Responses in Cancer Plenum. Similarly, Tumor angiogenesis factor (TAF) is released at a higher level in tumor cells than their normal counterparts. See, e.g., Folkman (1992) Angiogenesis and Cancer, Sem. Cancer Biol.

Various techniques which measure the release of these factors are described in Freshney (1994), supra. Also, see, Unkless, et al. (1974) J. Biol. Chem. 249:4295-4305; Strickland and Beers (1976) J. Biol. Chem. 251:5694-5702; Whur, et al. (1980) Br. J. Cancer 42:305-312; Gullino, "Angiogenesis, tumor vascularization, and potential interference with tumor growth" pp. 178-184 in Mihich (ed. 1985) Biological Responses in Cancer Plenum; and Freshney (1985) Anticancer Res. 5:111-130.

Invasiveness into Matrigel

The degree of invasiveness into Matrigel or some other extracellular matrix constituent can be used as an assay to identify compounds that modulate prostate cancer-associated sequences. Tumor cells exhibit a good correlation between malignancy and invasiveness of cells into Matrigel or some other extracellular matrix constituent. In this assay, tumorigenic cells are typically used as host cells. Expression of a tumor suppressor gene in these host cells would decrease invasiveness of the host cells.

Techniques described in Freshney (1994), supra, can be used. Briefly, the level of invasion of host cells can be measured by using filters coated with Matrigel or some other extracellular matrix constituent. Penetration into the gel, or through to the distal side of the filter, is rated as invasiveness, and rated histologically by number of cells and distance moved, or by prelabeling the cells with ^{125}I and counting the radioactivity on the distal side of the filter or bottom of the dish. See, e.g., Freshney (1984), supra.

Tumor growth in vivo

Effects of prostate cancer-associated sequences on cell growth can be tested in transgenic or immune-suppressed mice. Knock-out transgenic mice can be made, in which the prostate cancer gene is disrupted or in which a prostate cancer gene is inserted. Knock-out transgenic mice can be made by insertion of a marker gene or other heterologous gene into the endogenous prostate cancer gene site in the mouse genome via homologous recombination. Such mice can also be made by substituting the endogenous prostate cancer gene with a mutated version of the prostate cancer gene, or by mutating the endogenous prostate cancer gene, e.g., by exposure to carcinogens.

A DNA construct is introduced into the nuclei of embryonic stem cells. Cells containing the newly engineered genetic lesion are injected into a host mouse embryo, which is re-implanted into a recipient female. Some of these embryos develop into chimeric mice that possess germ cells partially derived from the mutant cell line. Therefore, by breeding the chimeric mice it is possible to obtain a new line of mice containing the introduced genetic lesion (see, e.g., Capecchi, et al. (1989) Science 244:1288-1292). Chimeric targeted mice can be derived according to Hogan, et al. (1988) Manipulating the Mouse Embryo: A Laboratory Manual CSH Press; and Robertson (ed. 1987) Teratocarcinomas and Embryonic Stem Cells: A Practical Approach IRL Press, Washington, D.C.

Alternatively, various immune-suppressed or immune-deficient host animals can be used. For example, genetically athymic "nude" mouse (see, e.g., Giovanella, et al. (1974) J. Natl. Cancer Inst. 52:921-930), a SCID mouse, a thymectomized mouse, or an irradiated mouse (see, e.g., Bradley, et al. (1978) Br. J. Cancer 38:263-272; Selby, et al. (1980) Br. J. Cancer 41:52-61) can be used as a host. Transplantable tumor cells (typically about 10^6 cells) injected into isogenic hosts will produce invasive tumors in a high proportions of cases, while normal cells of similar origin will not. In hosts which developed invasive tumors, cells expressing a prostate cancer-associated sequences are injected subcutaneously. After a suitable length of time, preferably 4-8 weeks, tumor growth is measured (e.g., by volume or by its two largest dimensions) and compared to the control. Tumors that have statistically significant reduction (using, e.g., Student's T test) are said to have inhibited growth.

Polynucleotide modulators of prostate cancer

Antisense and RNAi Polynucleotides

In certain embodiments, the activity of a prostate cancer-associated protein is down-regulated, or entirely inhibited, by the use of antisense polynucleotide, i.e., a nucleic acid complementary to, and which can preferably hybridize specifically to, a coding mRNA nucleic acid sequence, e.g., a prostate cancer protein mRNA, or a subsequence thereof. Binding of the antisense polynucleotide to the mRNA reduces the translation and/or stability of the mRNA.

In the context of this invention, antisense polynucleotides can comprise naturally-occurring nucleotides, or synthetic species formed from naturally-occurring subunits or their close homologs. Antisense polynucleotides may also have altered sugar moieties or inter-sugar linkages. Exemplary among these are the phosphorothioate and other sulfur containing species which are known for use in the art. Analogs are comprehended by this invention so long as they function effectively to hybridize with the prostate cancer protein mRNA. See, e.g., Isis Pharmaceuticals, Carlsbad, CA; Sequitor, Inc., Natick, MA.

Such antisense polynucleotides can readily be synthesized using recombinant means, or can be synthesized in vitro. Equipment for such synthesis is sold by several vendors, including Applied Biosystems. The preparation of other oligonucleotides such as phosphorothioates and alkylated derivatives is also well known to those of skill in the art.

Antisense molecules as used herein include antisense or sense oligonucleotides. Sense oligonucleotides can, e.g., be employed to block transcription by binding to the anti-sense strand. The antisense and sense oligonucleotide comprise a single-stranded nucleic acid sequence (either RNA or DNA) capable of binding to target mRNA (sense) or DNA (antisense) sequences for prostate cancer molecules. A preferred antisense molecule is for a prostate cancer sequences in Tables 1A-4, or for a ligand or activator thereof. Antisense or sense oligonucleotides, according to the present invention, comprise a fragment generally at least about 14 nucleotides, preferably from about 14 to 30 nucleotides. The ability to derive an antisense or a sense oligonucleotide, based upon a cDNA sequence encoding a given protein is described in, e.g., Stein and Cohen (1988) Cancer Res. 48:2659-2668; and van der Krol, et al. (1988) BioTechniques 6:958-976.

RNA interference is a mechanism to suppress gene expression in a sequence specific manner. See, e.g., Brumelkamp, et al. (2002) Sciencexpress (21March2002); Sharp (1999) Genes Dev. 13:139-141; and Cathew (2001) Curr. Op. Cell Biol. 13:244-248. In mammalian cells, short, e.g., 21 nt, double stranded small interfering RNAs (siRNA) have been shown to

be effective at inducing an RNAi response. See, e.g., Elbashir, et al. (2001) Nature 411:494-498. The mechanism may be used to downregulate expression levels of identified genes, e.g., treatment of or validation of relevance to disease.

Ribozymes

In addition to antisense polynucleotides, ribozymes can be used to target and inhibit transcription of prostate cancer-associated nucleotide sequences. A ribozyme is an RNA molecule that catalytically cleaves other RNA molecules. Different kinds of ribozymes have been described, including group I ribozymes, hammerhead ribozymes, hairpin ribozymes, RNase P, and axhead ribozymes (see, e.g., Castanotto, et al. (1994) Adv. in Pharmacology 25: 289-317 for a general review of the properties of different ribozymes).

The general features of hairpin ribozymes are described, e.g., in Hampel, et al. (1990) Nucl. Acids Res. 18:299-304; European Patent Publication No. 0 360 257; U.S. Patent No. 5,254,678. Methods of preparing are well known to those of skill in the art. See, e.g., WO 94/26877; Ojwang, et al. (1993) Proc. Natl. Acad. Sci. USA 90:6340-6344; Yamada, et al. (1994) Human Gene Therapy 1:39-45; Leavitt, et al. (1995) Proc. Natl. Acad. Sci. USA 92:699-703; Leavitt, et al. (1994) Human Gene Therapy 5:1151-120; and Yamada, et al. (1994) Virology 205:121-126.

Polynucleotide modulators of prostate cancer may be introduced into a cell containing the target nucleotide sequence by formation of a conjugate with a ligand binding molecule, as described in WO 91/04753. Suitable ligand binding molecules include, but are not limited to, cell surface receptors, growth factors, other cytokines, or other ligands that bind to cell surface receptors. Preferably, conjugation of the ligand binding molecule does not substantially interfere with the ability of the ligand binding molecule to bind to its corresponding molecule or receptor, or block entry of the sense or antisense oligonucleotide or its conjugated version into the cell. Alternatively, a polynucleotide modulator of prostate cancer may be introduced into a cell containing the target nucleic acid sequence, e.g., by formation of an polynucleotide-lipid complex, as described in WO 90/10448. It is understood that the use of antisense molecules or knock out and knock in models may also be used in screening assays as discussed above, in addition to methods of treatment.

Thus, in one embodiment, methods of modulating prostate disorders, e.g., cancer in cells or organisms, are provided. In one embodiment, the methods comprise administering to

a patient, e.g., to a cell within the patient, an anti-prostate cancer antibody that reduces or eliminates the biological activity of an endogenous prostate cancer protein. Alternatively, the methods comprise administering to a cell or organism a recombinant nucleic acid encoding a prostate cancer protein. This may be accomplished in many ways. In a preferred embodiment, e.g., when the prostate cancer sequence is down-regulated in prostate cancer, such state may be reversed by increasing the amount of prostate cancer gene product in the cell. This can be accomplished, e.g., by overexpressing the endogenous prostate cancer gene or administering a gene encoding the prostate cancer sequence, using known gene-therapy techniques, e.g.. In a preferred embodiment, the gene therapy techniques include the incorporation of the exogenous gene using enhanced homologous recombination (EHR), e.g., as described in PCT/US93/03868, hereby incorporated by reference in its entirety. Alternatively, e.g., when the prostate cancer sequence is up-regulated in prostate cancer, the activity of the endogenous prostate cancer gene is decreased, e.g., by the administration of a prostate cancer antisense nucleic acid.

In one embodiment, the prostate cancer proteins of the present invention may be used to generate polyclonal and monoclonal antibodies to prostate cancer proteins. Similarly, the prostate cancer proteins can be coupled, using standard technology, to affinity chromatography columns. These columns may then be used to purify prostate cancer antibodies useful for production, diagnostic, or therapeutic purposes. In a preferred embodiment, the antibodies are generated to epitopes unique to a prostate cancer protein; that is, the antibodies show little or no cross-reactivity to other proteins. The prostate cancer antibodies may be coupled to standard affinity chromatography columns and used to purify prostate cancer proteins. The antibodies may also be used as blocking polypeptides, as outlined above, since they will specifically bind to the prostate cancer protein.

Methods of identifying variant prostate cancer-associated sequences

Without being bound by theory, expression of various prostate cancer sequences is correlated with prostate cancer or other prostate disorders. Accordingly, disorders based on mutant or variant prostate cancer genes may be determined. In one embodiment, the invention provides methods for identifying cells containing variant prostate cancer genes, e.g., determining all or part of the sequence of at least one endogenous prostate cancer genes in a cell. This may be accomplished using many sequencing techniques. In a preferred

embodiment, the invention provides methods of identifying the prostate cancer genotype of an individual, e.g., determining all or part of the sequence of at least one prostate cancer gene of the individual. This is generally done in at least one tissue of the individual, and may include the evaluation of a number of tissues or different samples of the same tissue. The method may include comparing the sequence of the sequenced prostate cancer gene to a known prostate cancer gene, e.g., a wild-type gene.

The sequence of all or part of the prostate cancer gene can then be compared to the sequence of a known prostate cancer gene to determine if differences exist. This can be done using many known homology programs, such as Bestfit, etc. In a preferred embodiment, the presence of a difference in the sequence between the prostate cancer gene of the patient and the known prostate cancer gene correlates with a disease state or a propensity for a disease state, as outlined herein.

In a preferred embodiment, the prostate cancer genes are used as probes to determine the number of copies of the prostate cancer gene in the genome.

In another preferred embodiment, the prostate cancer genes are used as probes to determine the chromosomal localization of the prostate cancer genes. Information such as chromosomal localization finds use in providing a diagnosis or prognosis in particular when chromosomal abnormalities such as translocations, and the like are identified in the prostate cancer gene locus.

Administration of pharmaceutical and vaccine compositions

In one embodiment, a therapeutically effective dose of a prostate cancer protein or modulator thereof, is administered to a patient. By "therapeutically effective dose" herein is meant a dose that produces effects for which it is administered. The exact dose will depend on the purpose of the treatment, and will be ascertainable by one skilled in the art using known techniques (e.g., Ansel, et al. (1992) Pharmaceutical Dosage Forms and Drug Delivery; Lieberman (1993) Pharmaceutical Dosage Forms (vols. 1-3, Dekker, ISBN 0824770846, 082476918X, 0824712692, 0824716981; Lloyd (1999) The Art, Science and Technology of Pharmaceutical Compounding Amer. Pharma. Assn.; and Pickar (1999) Dosage Calculations Thomson). Adjustments for prostate cancer degradation, systemic versus localized delivery, and rate of new protease synthesis, as well as the age, body weight, general health, sex, diet, time of administration, drug interaction, and the severity of the

condition may be necessary, and will be ascertainable with routine experimentation by those skilled in the art. U.S. Patent Application N. 09/687,576 further discloses the use of compositions and methods of diagnosis and treatment in prostate cancer is hereby expressly incorporated by reference.

A "patient" for the purposes of the present invention includes both humans and other animals, particularly mammals. Thus the methods are applicable to both human therapy and veterinary applications. In the preferred embodiment the patient is a mammal, preferably a primate, and in the most preferred embodiment the patient is human. The patient typically will suffer from a prostate proliferative disorder, e.g., malignant or non-malignant, and may include cancer of other related conditions or disorders.

The administration of the prostate cancer proteins and modulators thereof of the present invention can be done in a variety of ways as discussed above, including, but not limited to, orally, subcutaneously, intravenously, intranasally, transdermally, intraperitoneally, intramuscularly, intrapulmonary, vaginally, rectally, or intraocularly. In some instances, e.g., in the treatment of wounds and inflammation, the prostate cancer proteins and modulators may be directly applied as a solution or spray, or via catheter.

The pharmaceutical compositions of the present invention comprise a prostate cancer protein in a form suitable for administration to a patient. In the preferred embodiment, the pharmaceutical compositions are in a water soluble form, such as being present as pharmaceutically acceptable salts, which is meant to include both acid and base addition salts. "Pharmaceutically acceptable acid addition salt" refers to those salts that retain the biological effectiveness of the free bases and that are not biologically or otherwise undesirable, formed with inorganic acids such as hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid and the like, and organic acids such as acetic acid, propionic acid, glycolic acid, pyruvic acid, oxalic acid, maleic acid, malonic acid, succinic acid, fumaric acid, tartaric acid, citric acid, benzoic acid, cinnamic acid, mandelic acid, methanesulfonic acid, ethanesulfonic acid, p-toluenesulfonic acid, salicylic acid, and the like. "Pharmaceutically acceptable base addition salts" include those derived from inorganic bases such as sodium, potassium, lithium, ammonium, calcium, magnesium, iron, zinc, copper, manganese, aluminum salts, and the like. Particularly preferred are the ammonium, potassium, sodium, calcium, and magnesium salts. Salts derived from pharmaceutically acceptable organic non-toxic bases include salts of primary, secondary, and tertiary amines,

substituted amines including naturally occurring substituted amines, cyclic amines and basic ion exchange resins, such as isopropylamine, trimethylamine, diethylamine, triethylamine, tripropylamine, and ethanolamine.

The pharmaceutical compositions may also include one or more of the following: carrier proteins such as serum albumin; buffers; fillers such as microcrystalline cellulose, lactose, corn and other starches; binding agents; sweeteners and other flavoring agents; coloring agents; and polyethylene glycol.

The pharmaceutical compositions can be administered in a variety of unit dosage forms depending upon the method of administration. For example, unit dosage forms suitable for oral administration include, but are not limited to, powder, tablets, pills, capsules and lozenges. It is recognized that prostate cancer protein modulators (e.g., antibodies, antisense constructs, ribozymes, small organic molecules, etc.) when administered orally, should be protected from digestion. This is typically accomplished either by complexing the molecule(s) with a composition to render it resistant to acidic and enzymatic hydrolysis, or by packaging the molecule(s) in an appropriately resistant carrier, such as a liposome or a protection barrier. Means of protecting agents from digestion are well known in the art.

The compositions for administration will commonly comprise a prostate cancer protein modulator dissolved in a pharmaceutically acceptable carrier, preferably an aqueous carrier. A variety of aqueous carriers can be used, e.g., buffered saline and the like. These solutions are typically sterile and generally free of undesirable matter. These compositions may be sterilized by conventional, well known sterilization techniques. The compositions may contain pharmaceutically acceptable auxiliary substances as required to approximate physiological conditions such as pH adjusting and buffering agents, toxicity adjusting agents and the like, e.g., sodium acetate, sodium chloride, potassium chloride, calcium chloride, sodium lactate, and the like. The concentration of active agent in these formulations can vary widely, and will be selected primarily based on fluid volumes, viscosities, body weight, and the like in accordance with the particular mode of administration selected and the patient's needs (e.g., (1980) Remington's Pharmaceutical Science (15th ed.); and Hardman, et al. (eds. 2001) Goodman & Gilman: The Pharmacological Basis of Therapeutics McGraw-Hill.

Thus, a typical pharmaceutical composition for intravenous administration would be about 0.1 to 10 mg per patient per day. Dosages from 0.1 up to about 100 mg per patient per day may be used, particularly when the drug is administered to a secluded site and not into

the blood stream, such as into a body cavity or into a lumen of an organ. Substantially higher dosages are possible in topical administration. Actual methods for preparing parenterally administrable compositions will be known or apparent to those skilled in the art, e.g., Remington's Pharmaceutical Science and Goodman and Gilman: The Pharmacological Basis of Therapeutics, supra.

The compositions containing modulators of prostate cancer proteins can be administered for therapeutic or prophylactic treatments. In therapeutic applications, compositions are administered to a patient suffering from a disease (e.g., a cancer) in an amount sufficient to cure or at least partially retard or arrest the disease and its complications. An amount adequate to accomplish this is defined as a "therapeutically effective dose." Amounts effective for this use will depend upon the severity of the disease and the general state of the patient's health. Single or multiple administrations of the compositions may be administered depending on the dosage and frequency as required and tolerated by the patient. The composition should provide a sufficient quantity of the agents of this invention to effectively treat the patient. An amount of modulator that is capable of preventing or slowing the development of cancer in a mammal is referred to as a "prophylactically effective dose." The particular dose required for a prophylactic treatment will depend upon the medical condition and history of the mammal, the particular cancer being prevented, as well as other factors such as age, weight, gender, administration route, efficiency, etc. Such prophylactic treatments may be used, e.g., in a mammal who has previously had cancer to prevent a recurrence of the cancer, or in a mammal who is suspected of having a significant likelihood of developing cancer, e.g., based partly on gene expression profiles.

It will be appreciated that the present prostate cancer protein-modulating compounds can be administered alone or in combination with additional prostate cancer modulating compounds or with other therapeutic agent, e.g., other anti-cancer agents or treatments.

In numerous embodiments, one or more nucleic acids, e.g., polynucleotides comprising nucleic acid sequences set forth in Tables 1A-4such as antisense polynucleotides, silencing RNA, or ribozymes, will be introduced into cells, in vitro or in vivo. The present invention provides methods, reagents, vectors, and cells useful for expression of prostate cancer-associated polypeptides and nucleic acids using in vitro (cell-free), ex vivo or in vivo (cell or organism-based) recombinant expression systems.

The particular procedure used to introduce the nucleic acids into a host cell for expression of a protein or nucleic acid is application specific. Many procedures for introducing foreign nucleotide sequences into host cells may be used. These include the use of calcium phosphate transfection, spheroplasts, electroporation, liposomes, microinjection, plasma vectors, viral vectors, and many other well known methods for introducing cloned genomic DNA, cDNA, synthetic DNA, or other foreign genetic material into a host cell (see, e.g., Berger and Kimmel (1987) Guide to Molecular Cloning Techniques from Methods in Enzymology (vol. 152) Academic Press; Ausubel, et al., (eds. supplemented through 1999) Current Protocols Lippincott; and Sambrook, et al. (1989) Molecular Cloning: A Laboratory Manual (2d ed., Vol. 1-3) CSH Press.

In a preferred embodiment, prostate cancer proteins and modulators are administered as therapeutic agents, and can be formulated as outlined above. Similarly, prostate cancer genes (including both the full-length sequence, partial sequences, or regulatory sequences of the prostate cancer coding regions) can be administered in a gene therapy application. These prostate cancer genes can include antisense applications, either as gene therapy (i.e., for incorporation into the genome) or as antisense compositions, as will be appreciated by those in the art.

Prostate cancer polypeptides and polynucleotides can also be administered as vaccine compositions to stimulate HTL, CTL, and antibody responses.. Such vaccine compositions can include, e.g., lipidated peptides (see, e.g.,Vitiello, et al. (1995) J. Clin. Invest. 95:341-349), peptide compositions encapsulated in poly(DL-lactide-co-glycolide) ("PLG") microspheres (see, e.g., Eldridge, et al. (1991) Molec. Immunol. 28:287-294; Alonso, et al. (1994) Vaccine 12:299-306; Jones, et al. (1995) Vaccine 13:675-681), peptide compositions contained in immune stimulating complexes (ISCOMS) (see, e.g., Takahashi, et al. (1990) Nature 344:873-875; Hu, et al. (1998) Clin Exp Immunol. 113:235-243), multiple antigen peptide systems (MAPs) (see, e.g., Tam (1988) Proc. Natl. Acad. Sci. USA 85:5409-5413; Tam (1996) J. Immunol. Methods 196:17-32), peptides formulated as multivalent peptides; peptides for use in ballistic delivery systems, typically crystallized peptides, viral delivery vectors (Perkus, et al., p. 379, in Kaufmann (ed. 1996) Concepts in vaccine development de Gruyter; Chakrabarti, et al. (1986) Nature 320:535-537; Hu, et al. (1986) Nature 320:537-540; Kieny, et al. (1986) AIDS Bio/Technology 4:790-xxx; Top, et al. (1971) J. Infect. Dis. 124:148-154; Chanda, et al. (1990) Virology 175:535-547), particles of viral or synthetic

origin (see, e.g., Kofler, et al. (1996) J. Immunol. Methods 192:25-35; Eldridge, et al. (1993) Sem. Hematol. 30:16-24; Falo, et al. (1995) Nature Med. 7:649-653), adjuvants (Warren, et al. (1986) Annu. Rev. Immunol. 4:369-388; Gupta, et al. (1993) Vaccine 11:293-306), liposomes (Reddy, et al. (1992) J. Immunol. 148:1585-1589; Rock (1996) Immunol. Today 17:131-137), or, naked or particle absorbed cDNA (Ulmer, et al. (1993) Science 259:1745-1749; Robinson, et al. (1993) Vaccine 11:957-960; Shiver, et al., p. 423, in Kaufmann (ed. 1996) Concepts in Vaccine Development de Gruyter; Cease and Berzofsky (1994) Annu. Rev. Immunol. 12:923-989; and Eldridge, et al. (1993) Sem. Hematol. 30:16-24). Toxin-targeted delivery technologies, also known as receptor mediated targeting, such as those of Avant Immunotherapeutics, Inc. (Needham, Massachusetts) may also be used.

Vaccine compositions often include adjuvants. Many adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, Bortadella pertussis or Mycobacterium tuberculosis derived proteins. Certain adjuvants are commercially available as, e.g., Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); AS-2 (SmithKline Beecham, Philadelphia, PA); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A, and quil A. Cytokines, such as GM-CSF, interleukin-2, -7, -12, and other like growth factors, may also be used as adjuvants.

Vaccines can be administered as nucleic acid compositions wherein DNA or RNA encoding one or more of the polypeptides, or a fragment thereof, is administered to a patient. This approach is described, for instance, in Wolff, et al. (1990) Science 247:1465-1468 as well as U.S. Patent Nos. 5,580,859; 5,589,466; 5,804,566; 5,739,118; 5,736,524; 5,679,647; WO 98/04720; and in more detail below. Examples of DNA-based delivery technologies include "naked DNA", facilitated (bupivicaine, polymers, peptide-mediated) delivery, cationic lipid complexes, and particle-mediated ("gene gun") or pressure-mediated delivery (see, e.g., U.S. Patent No. 5,922,687).

For therapeutic or prophylactic immunization purposes, the peptides of the invention can be expressed by viral or bacterial vectors. Examples of expression vectors include

attenuated viral hosts, such as vaccinia or fowlpox. This approach involves the use of vaccinia virus, e.g., as a vector to express nucleotide sequences that encode prostate cancer polypeptides or polypeptide fragments. Upon introduction into a host, the recombinant vaccinia virus expresses the immunogenic peptide, and thereby elicits an immune response. Vaccinia vectors and methods useful in immunization protocols are described in, e.g., U.S. Patent No. 4,722,848. Another vector is BCG (Bacille Calmette Guerin). BCG vectors are described in Stover, et al. (1991) Nature 351:456-460. A wide variety of other vectors useful for therapeutic administration or immunization, e.g., adeno and adeno-associated virus vectors, retroviral vectors, Salmonella typhi vectors, detoxified anthrax toxin vectors, and the like, will be apparent to those skilled in the art from the description herein (see, e.g., Shata, et al. (2000) Mol. Med. Today 6:66-71; Shedlock, et al. (2000) J. Leuk. Biol. 68:793-806; Hipp, et al. (2000) In Vivo 14:571-85).

Methods for the use of genes as DNA vaccines are well known, and include placing a prostate cancer gene or portion of a prostate cancer gene under the control of a regulatable promoter or a tissue-specific promoter for expression in a prostate cancer patient. The prostate cancer gene used for DNA vaccines can encode full-length prostate cancer proteins, but more preferably encodes portions of the prostate cancer proteins including peptides derived from the prostate cancer protein. In one embodiment, a patient is immunized with a DNA vaccine comprising a plurality of nucleotide sequences derived from a prostate cancer gene. For example, prostate cancer-associated genes or sequence encoding subfragments of a prostate cancer protein are introduced into expression vectors and tested for their immunogenicity in the context of Class I MHC and an ability to generate cytotoxic T cell responses. This procedure may provide for production of cytotoxic T lymphocyte responses against cells which present antigen, including intracellular epitopes.

In a preferred embodiment, the DNA vaccines include a gene encoding an adjuvant molecule with the DNA vaccine. Such adjuvant molecules include cytokines that increase the immunogenic response to the prostate cancer polypeptide encoded by the DNA vaccine. Additional or alternative adjuvants are available.

In another preferred embodiment prostate cancer genes find use in generating animal models of prostate cancer. When the prostate cancer gene identified is repressed or diminished in cancer tissue, gene therapy technology, e.g., wherein antisense RNA directed to the prostate cancer gene will also diminish or repress expression of the gene. Animal

models of prostate cancer find use in screening for modulators of a prostate cancer-associated sequence or modulators of prostate cancer. Similarly, transgenic animal technology including gene knockout technology, e.g., as a result of homologous recombination with an appropriate gene targeting vector, will result in the absence or increased expression of the prostate cancer protein. When desired, tissue-specific expression or knockout of the prostate cancer protein may be necessary.

It is also possible that the prostate cancer protein is overexpressed in prostate cancer. As such, transgenic animals can be generated that overexpress the prostate cancer protein. Depending on the desired expression level, promoters of various strengths can be employed to express the transgene. Also, the number of copies of the integrated transgene can be determined and compared for a determination of the expression level of the transgene. Animals generated by such methods find use as animal models of prostate cancer and are additionally useful in screening for modulators to treat prostate cancer.

Kits for Use in Diagnostic and/or Prognostic Applications

For use in diagnostic, research, and therapeutic applications suggested above, kits are also provided by the invention. In the diagnostic and research applications such kits may include one of the following: assay reagents, buffers, prostate cancer-specific nucleic acids or antibodies, hybridization probes and/or primers, antisense polynucleotides, silencing RNA, ribozymes, dominant negative prostate cancer polypeptides or polynucleotides, small molecules inhibitors of prostate cancer-associated sequences, etc. A therapeutic product may include sterile saline or another pharmaceutically acceptable emulsion and suspension base.

In addition, the kits may include instructional materials containing instructions (i.e., protocols) for the practice of the methods of this invention. While the instructional materials typically comprise written or printed materials they are not limited to such. A medium capable of storing such instructions and communicating them to an end user is contemplated by this invention. Such media include, but are not limited to electronic storage media (e.g., magnetic discs, tapes, cartridges, chips), optical media (e.g., CD ROM), and the like. Such media may include addresses to internet sites that provide such instructional materials.

The present invention also provides for kits for screening for modulators of prostate cancer-associated sequences. Such kits can be prepared from readily available materials and reagents. For example, such kits can comprise one or more of the following materials: a

prostate cancer-associated polypeptide or polynucleotide, reaction tubes, and instructions for testing prostate cancer-associated activity. Optionally, the kit contains biologically active prostate cancer protein. A wide variety of kits and components can be prepared according to the present invention, depending upon the intended user of the kit and the particular needs of the user. Diagnosis would typically involve evaluation of a plurality of genes or products. The genes will be selected based on correlations with important parameters in disease which may be identified in historical or outcome data.

EXAMPLES

Example 1: Gene Chip Analyses of Expression Profiles

Molecular profiles of various normal and cancerous tissues were determined and analyzed using gene chips. RNA was isolated and gene chip analysis was performed as described (Glynne, et al. (2000) Nature 403:672-676; Zhao, et al. (2000) Genes Dev. 14:981-993).

EXAMPLE 2: Identification of androgen dependent/independent genes

To identify gene expression changes during the transition from androgen-dependent to androgen-independent prostate cancer, oligonucleotide microarrays ("K" chips or Affymetrix Eos Hu03) were interrogated with cRNAs derived from the human CWR22 prostate cancer xenograft model propagated in nude mice (Pretlow, et al. (1993) J. Natl. Cancer Inst. 85:394-398). The CWR22 xenograft is androgen-dependent when grown in male Nude mice. Androgen-independent sub-lines can be derived by first establishing androgen-dependent tumors in male mice. The mice are then castrated to remove the primary source of growth stimulus (androgen), resulting in tumor regression. Within 3-10 months molecular events prompt the tumors to relapse and start growing as androgen-independent tumors. See, e.g., Nagabhushan, et al. (1996) Cancer Res. 56:3042-3046; Amler, et al. (2000) Cancer Res. 60:6134-6141; and Bubendorf, et al. (1999) J. Natl. Cancer Inst. 91:1758-1764.

Using the CWR22 xenograft model, tumors were grown subcutaneously in male nude mice. Tumors were harvested at different times after castration. The time points post-castration included (in days): 0, 1, 3, 4, 5, 10, 30, 40, 50, 51, 52, 59, 60, 61, 70, 79, 80, 82, 120, and 125. Analyses also included established androgen-independent xenografts. Castration resulted in tumor regression. At day 120 and thereafter, the tumors relapsed and started growing in the absence of androgen.

cRNAs were generated by in vitro transcription assays (IVTs) from the different samples and were hybridized to the oligonucleotide microarrays (Affymetrix Eos Hu03). Hybridization was measured by the average fluorescence intensity (AI), which is directly proportional to the expression level of the gene.

Two types of analyses were applied to the results:

Analysis A:

The samples were divided into different time groups which included the following time points post castration (in days): 1-5, 10, 30-40, 50-82, 120-125. To identify changes in gene expression, the following calculations were made:

1. The median (or mean, in case there were only 2 samples in a group) was calculated for each group.

2. The medians (or means) for each group was compared to one-another.

3. Genes were selected that exhibited a minimum 2 fold difference in the median (or mean) between any of the groups.

4. The change in gene expression over time was analyzed for each selected gene to look for specific pattern changes.

Only genes with an interesting expression pattern during the androgen-ablation time course were selected as potential new therapeutic targets and/or diagnostic markers. Among the 70,000 gene clusters present on Hu01 and Hu02, we identified 820 gene clusters with the desired expression patterns. These expression patterns can be broadly defined into the following categories:

1. Genes that are expressed early in the time course, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-hi pattern in Table 1A).

2. Genes that are expressed early in the time course, then drop off in expression, and do not express again with emergence of androgen-independence (hi-lo-lo pattern in Table 1A).

3. Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-hi pattern in Table 1A).

4. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-hi-hi pattern in Table 1A).

5. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-hi-lo pattern in Table 1A).

Group 1 is characterized by cell-cycle regulating genes, such as those encoding cyclin B1, p21/WAF1, CDC18-homolog, cyclin A2, cyclin D1, and possible growth factors such as hAG2 (anterior gradient 2 homolog) among others. This indicates that interruption of growth factor and/or cell cycle pathways prevents the emergence of androgen-independent disease, making group 1 genes good targets for treating advanced prostate cancer.

Group 2 represents genes that are androgen-dependent, and do not re-express due to the lack of androgen signal in the androgen-independent phenotype. This group includes genes encoding proteins such as Fibronectin 1, which has been previously shown to be down-regulated with androgen-withdrawal (Amler, et al. (2000) Cancer Res. 60:6134-6141).

Group 3 represents genes that are up-regulated by signals that induce the androgen-independent phenotype. This group includes genes encoding stanniocalcin 2, c-fos proto-oncogene product, vascular endothelial growth factor, the cell surface protein transmembrane 4 superfamily member 1 and adrenomedullin among others. Adrenomedullin has recently been shown to act as an autocrine growth factor for the androgen-independent prostate cancer cell line DU145 (Rocchi, et al. (2001) Cancer Res. 61:1196-1206), indicating that its up-regulation is critical for supporting an androgen-independent phenotype. Blocking adrenomedullin function, and/or other genes in this group, prevents the growth of androgen-independent tumor cells.

Group 4 represents genes that are androgen-repressed and are only expressed in the absence of androgen. This group includes genes encoding the protein tyrosine phosphatase interacting protein liprin-alpha 2, the CD24 antigen, and the catalytic subunit for phosphatidylinositol 4-kinase amongst others. Patients that are treated for advanced prostate cancer by hormone-ablation may have in their bodies cells that have survived hormone-ablation and are likely to up-regulate genes that belong to Group 4. Therefore, Group 4 gene products are particularly good therapeutic targets for treating patients undergoing hormone-ablation therapy.

Group 5 represents genes that are involved in regulating signals that induce an androgen-independent phenotype. This group includes genes encoding Rab2 (a Ras-like G protein), the Son of Sevenless homolog (a GTP/GDP exchange factor involved in activating Ras-like proteins), and the p85 regulatory subunit for phosphoinositide-3-kinase (PI3-kinase). The PI3-kinase pathway has been implicated in providing a survival signal to the prostate cancer cell line LNCaP (Lin, et al. (1999) Cancer Res. 59:2891-2897). This indicates that ras-like signals and signals dependent on PI3-kinase are involved in inducing the androgen-independent phenotype. For that reason, Group 5 gene products are particularly good therapeutic targets for treating patients undergoing hormone-ablation therapy.

Analysis B:

For the second analysis, the samples were divided into 4 time groups which included the following time points post castration (in days): 0-1, 3-5, 10-82, >120. To identify changes in gene expression, the following analysis was performed:

1. Genes were selected that exhibited a minimum of 100 AI units at the 90^{th} percentile expression level of samples.

2. The group mean expression levels for each gene were calculated. The genes were further sub-selected to exhibit a minimum 3 fold difference between the group means.

3. An analysis of variance was then performed on selected genes. From the original 59,680 gene clusters present on the Hu03 gene chip, only about 1165 genes with a P value of < 0.01 were identified that also exhibited the above mentioned parameters.

4. A method was then employed for calculating the positive false discovery rate (pFDR), i.e., an estimate of the proportion of false-positives present in a set of findings (Storey and Tibshirani (2001) Technical Report, Department of Statistics, Stanford University, CA). This technique was developed explicitly for use with microarray data. The procedure involves randomly assigning the membership status of each sample to a group and re-performing the analysis of variance. In each simulation, the number of group members (6 for Group 1, 9 for group 2, 15 for group 3, and 4 for group 4) remained constant, but these designations were shuffled and assigned to each sample at random. The permutation was performed 1000 times, and for each simulation, the number of findings at $P < 0.01$ was noted. The number of false positives under null conditions, was then divided by the number of actual findings (n=1165 genes) to obtain an estimate of the proportion of false positive findings. After the application of a correction factor, the final estimate for the pFDR was about 1%. Thus, one can expect that approximately 12 of the 1165 findings are false positives.

5. The approximately 1165 genes were clustered by expression pattern to identify specific pattern changes. Only genes with an interesting expression pattern during the androgen-ablation time course were selected as potential new therapeutic targets and/or diagnostic markers. These expression patterns can be broadly defined into the following categories:

1. Genes that are expressed early in the time course of androgen withdrawal, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-lo-hi pattern in Table 2A).

2. Genes that are expressed early in the time course, then drop off in expression immediately after androgen-withdrawal, and do not express again with emergence of androgen-independence (hi-lo-lo-lo pattern in Table 2A).

3. Genes that are expressed early in the time course, then drop off in expression after several days of androgen withdrawal, and do not express again with emergence of androgen-independence (hi-hi-lo-lo pattern in Table 2A).

4. Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-lo-hi pattern in Table 2A).

5. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-lo-hi-hi pattern in Table 2A).

6. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-lo-hi-lo pattern in Table 2A).

Group 1 is characterized by cell-cycle regulating genes and cell growth promoting genes, such as those encoding cyclin B1 and CDC45 among others, growth factors/hormones such as hAG2 (anterior gradient 2 homolog), adrenomedullin, and stanniocalcin 2 among others, and growth factor receptors, such as the bone morphogenic protein receptor type 1B (BMP-R1B) and the endothelial differentiation lysophosphatidic acid G-protein-coupled receptor 7 among others. Adrenomedullin has recently been shown to act as an autocrine growth factor for the androgen-independent prostate cancer cell line DU145 (Rocchi, et al. (2001) Cancer Res. 61:1196-1206), indicating that its up-regulation is critical for supporting an androgen-independent phenotype. This indicates that interruption of growth factor and/or cell cycle pathways prevents the emergence of androgen-independent disease, making group 1 genes good targets for treating both localized and advanced prostate cancer and related conditions.

Group 2 represents genes that are androgen-dependent, and do not re-express due to the lack of androgen signal in the androgen-independent phenotype. This group includes genes encoding proteins such as the endothelial protein C receptor (EPCR) and the potassium intermediate/small conductance calcium-activated channel (subfamily N, member 2). These genes represent targets for treating androgen-dependent prostate cancer and related conditions.

Group 3 also represents genes that are androgen-dependent, and do not re-express due to the lack of androgen signal in the androgen-independent phenotype. This group includes genes encoding proteins such as Fibronectin 1, which has been previously shown to be down-regulated with androgen-withdrawal (Amler, et al. (2000) Cancer Res. 60:6134-6141), and genes encoding signaling proteins such as Rho GTPase activating protein 1. These genes represent targets for treating androgen-dependent prostate cancer and related conditions.

Group 4 represents genes that are up-regulated by signals that induce and maintain the androgen-independent phenotype. This group includes genes encoding potential growth promoting proteins such as chemokine-like factor (Unigene ID Hs.15159), colon cancer-associated protein Mic1, and the mitogen-activated protein kinase-activated protein kinase 2. Blocking function of these proteins, and/or other genes in this group, prevents the growth of androgen-independent tumor cells and related conditions.

Group 5 represents genes that are androgen-repressed and are only expressed in the absence of androgen or that are induced by the absence of androgen. This group includes genes encoding transcriptional regulators such as the androgen receptor, the DNA activated protein kinase (catalytic subunit), and nuclear factor related to kappa B binding protein (NFRKB), among others. Patients that are treated for advanced prostate cancer by hormone-ablation may have in their bodies cells that have survived hormone-ablation and are likely to up-regulate genes that belong to Group 5. Therefore, Group 5 gene products are particularly good therapeutic targets for treating patients undergoing hormone-ablation therapy.

Group 6 represents genes that are involved in regulating signals that are induced during androgen withdrawal and that induce an androgen-independent phenotype. This group includes genes encoding signaling molecules such as phosphoinositide-3-kinase (class 2, alpha polypeptide), signal transducer and activator of transcription 2 (STAT2), phospholipase A2 (group IIA) and the protein tyrosine phosphatase interacting protein liprin-alpha 2, cell surface receptors such as gamma-aminobutyric acid (GABA) A receptor epsilon subunit, G protein-coupled receptor 48, and immune function proteins such as the major histocompatibility complex class II DR alpha. The PI3-kinase pathway has been implicated in providing a survival signal to the prostate cancer cell line LNCaP (Lin, et al. (1999) Cancer Res. 59:2891-2897). This indicates that ras-like signals and signals dependent on PI3-kinase are involved in inducing the androgen-independent phenotype. For that reason, Group 6 gene

products are particularly good therapeutic targets for treating patients undergoing hormone-ablation therapy.

TABLE 1A provides Accession numbers for genes, including expressed sequence tags, (incorporated in their entirety here and throughout the application where Accession numbers are provided). Genes with an interesting expression pattern during the androgen-ablation time course were selected as potential new therapeutic targets and/or diagnostic markers. 820 gene clusters were identified with desired expression patterns. These expression patterns can be broadly defined into the following categories:

1. Genes that are expressed early in the time course, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-hi pattern).
2. Genes that are expressed early in the time course, then drop off in expression, and do not express again with emergence of androgen-independence (hi-lo-lo pattern).
3. Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-hi pattern).
4. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-hi-hi pattern).
5. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-hi-lo pattern).

Table 1B lists accession numbers for primekeys lacking a unigeneID in table 1A. For each probeset is listed a gene cluster number from which oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Table 1C lists genomic positioning for primekeys lacking unigene ID's and accession numbers in tables 1A. For each predicted exon is listed genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

TABLE 1A

Pkey	ExAccn	UnigeneID	Unigena Title	pattern
102772	U83115	Hs.161002	absent in melanoma 1	hi-lo-hi
128610	N48373	Hs.10247	activatad laucocyte cell adhesion molecu	hi-lo-hi
102276	N48373	Hs.10247	aclivated leucocyle cell adhesion molecu	hi-lo-hi
100654	A03758			hi-lo-hi
100655	A03758			hi-lo-hi
135400	X78592	Hs.99915	androgen recepior (dihydroteslosierone r	hi-lo-hi
331363	AW582256	"Hs.91011	anlerior gradienl 2 (Xenepus laevis) hom	hi-lo-hi
115764	AW582256	"Hs.91011	anlerior gradienl 2 (Xenepus laevis) hom	hi-lo-hi
120483	BE251623	Hs.1578	baculoviral IAP repeat-containing 5 (sur	hi-lo-hi
101505	AA307680	Hs.75692	asparagine synlhelase	hi-lo-hi
127236	AW661857	Hs.98658	budding uninhibited by benzimidazoles 1	hi-lo-hi
128472	BE241880	"Hs.10029	calhepsin C	hi-lo-hi
102712	U77949	Hs.69563	CDC6 (cell division cycle 6, S. cerevisi	hi-lo-hi
314943	Y00272	Hs.184572	cell division cycle 2, G1 to S and G2 lo	hi-lo-hi
102123	NM_001809	"Hs.1594	centromere protein A (17kD)	hi-lo-hi
326213			CH.17_hs gi|5867224	hi-lo-hi
327110			CH.21_hs gi|6117842	hi-lo-hi
339186			CH22_DA59H18.GENSCAN.72-13	hi-lo-hi
337755			CH22_EM:AC000097.GENSCAN.109-2	hi-lo-hi
337674			CH22_EM:AC000097.GENSCAN.67-4	hi-lo-hi
337675			CH22_EM:AC000097.GENSCAN.67-6	hi-lo-hi
333516			CH22_FGENES.173_1	hi-lo-hi
333517			CH22_FGENES.173_2	hi-lo-hi
333795			CH22_FGENES.275_1	hi-lo-hi
333796			CH22_FGENES.275_3	hi-lo-hi
333808			CH22_FGENES.279_2	hi-lo-hi
333809			CH22_FGENES.280_2	hi-lo-hi
332792			CH22_FGENES.3_2	hi-lo-hi
334101			CH22_FGENES.327_59	hi-lo-hi
334502			CH22_FGENES.397_18	hi-lo-hi
334616			CH22_FGENES.411_15	hi-lo-hi
334899			CH22_FGENES.452_13	hi-lo-hi
334900			CH22_FGENES.452_14	hi-lo-hi
334902			CH22_FGENES.452_16	hi-lo-hi
334905			CH22_FGENES.452_20	hi-lo-hi
334906			CH22_FGENES.452_21	hi-lo-hi
334951			CH22_FGENES.465_20	hi-lo-hi
335044			CH22_FGENES.480_1	hi-lo-hi
335753			CH22_FGENES.604_2	hi-lo-hi
335755			CH22_FGENES.604_4	hi-lo-hi
333135			CH22_FGENES.83_11	hi-lo-hi
333137			CH22_FGENES.83_13	hi-lo-hi
333138			CH22_FGENES.83_15	hi-lo-hi
333139			CH22_FGENES.83_16	hi-lo-hi
336721			CH22_FGENES.83-17	hi-lo-hi
105012	AF098158	Hs.9329	chromosome 20 open reading frame 1	hi-lo-hi
134470	X54942	Hs.83758	CDC28 protein kinase 2	hi-lo-hi
134750	L29073	Hs.1139	cold shock domain protein A	hi-lo-hi
125819	AA044840	"Hs.251871	CTP synthase	hi-lo-hi
102993	BE262998	Hs.85137	cyclin A2	hi-lo-hi
131185	BE280074	Hs.23960	cyclin B1	hi-lo-hi
106350	AK001404	"Hs.194698	cyclin B2	hi-lo-hi
103080	AU077231	"Hs.82932	cyclin D1 (PRAD1: parathyroid adenomalos	hi-lo-hi
101216	AA284166	Hs.84113	cyclin-dependent kinase inhibitor 3 (CDK	hi-lo-hi
100589	AW247430	Hs.84152	cystathionine-beta-synthase	hi-lo-hi
130655	AI831962	Hs.17409	cysteine-rich protein 1 (intestinal)	hi-lo-hi
101473	M22976	Hs.83834	cytochrome b-5	hi-lo-hi
101468	BE538296	"Hs.181028	cytochrome c oxidase subunit Va	hi-lo-hi
103546	Z14244	"Hs.75752	cytochrome c oxidase subunit VIIb	hi-lo-hi
100829	AA471098	Hs.278544	acetyl-Coenzyme A acetyltransferase 2 (a	hi-lo-hi
102469	AF058293	Hs.180015	D-dopachrome tautomerase	hi-lo-hi

114292	AI815395	Hs.184641	fatty acid desaturase 2	hi-lo-hi
100656	BE250162	"Hs.83765	dihydrofolate reductase	hi-lo-hi
133799	W24087	Hs.76285	DKFZP564B167 protein	hi-lo-hi
129113	BE543205	"Hs.288771	DKFZP586A0522 protein	hi-lo-hi
332732	AF191019	Hs.8361	hypothetical protein, estradiol-induced	hi-lo-hi
108846	AL117452	"Hs.44155	DKFZP586G1517 protein	hi-lo-hi
133903	X63692	"Hs.77462	DNA (cytosine-5-)-methyltransferase 1	hi-lo-hi
320099	AW411307	Hs.114311	CDC45 (cell division cycle 45, S.cerevis	hi-lo-hi
321960	AA723883	Hs.302446	hypothetical protein MGC10334	hi-lo-hi
324988	AK001379	"Hs.121028	hypothetical protein FLJ10549	hi-lo-hi
303274	AK001468	Hs.62180	anillin (Drosophila Scraps homolog), act	hi-lo-hi
301804	AK001468	Hs.62180	anillin (Drosophila Scraps homolog), act	hi-lo-hi
300551	AW408800	Hs.104859	hypothetical protein DKFZp762E1312	hi-lo-hi
304541	AA482561	Hs.169476	glyceraldehyde-3-phosphate dehydrogenase	hi-lo-hi
304521	AA464716		gb:zx82c11.s1 Soares ovary tumor NbHOT H	hi-lo-hi
129075	BE250162	"Hs.83765	dihydrofolate reductase	hi-lo-hi
111003	N52980	Hs.83765	dihydrofolate reductase	hi-lo-hi
115536	AK001468	Hs.62180	anillin (Drosophila Scraps homolog), act	hi-lo-hi
108857	AK001468	Hs.62180	anillin (Drosophila Scraps homolog), act	hi-lo-hi
332397	AB027249	Hs.104741	PDZ-binding kinase; T-cell originated pr	hi-lo-hi
330714	AA263143	Hs.24596	RAD51-interacting protein	hi-lo-hi
104636	R82252	Hs.106106	Homo sapiens cAMP-dependent protein kine	hi-lo-hi
104986	AW088826	Hs.22971	ESTs	hi-lo-hi
105076	AI598252	Hs.37810	ESTs	hi-lo-hi
105312	BE613348	"Hs.23348	S-phase kinase-associated protein 2 (p45	hi-lo-hi
105388	AW575008	Hs.11355	thymopoietin	hi-lo-hi
105953	BE410556	Hs.236556	hypothetical protein STRAIT11499	hi-lo-hi
106286	AI765107	"Hs.274422	hypothetical protein FLJ20550	hi-lo-hi
106889	U46258	Hs.18349	HSPC145 protein	hi-lo-hi
109220	AW958181	Hs.189998	ESTs	hi-lo-hi
113158	AA328102	Hs.24641	cytoskeleton associated protein 2	hi-lo-hi
114542	AW970128	"Hs.293380	ESTs	hi-lo-hi
114986	AK000361	Hs.133260	hypothetical protein FLJ20354	hi-lo-hi
115291	BE545072	"Hs.122579	hypothetical protein FLJ10461	hi-lo-hi
115414	AA662240	Hs.283099	AF15q14 protein	hi-lo-hi
115471	AK001376	Hs.59346	hypothetical protein FLJ10514	hi-lo-hi
115522	BE614387	Hs.47378	ESTs, Moderately similar to T50635 hypot	hi-lo-hi
115652	BE093589	Hs.38178	hypothetical protein FLJ23468	hi-lo-hi
116121	AK001330	Hs.48855	hypothetical protein FLJ10468	hi-lo-hi
116130	AW183533	Hs.38178	hypothetical protein FLJ23468	hi-lo-hi
116448	BE268321	Hs.208912	hypothetical protein MGC861	hi-lo-hi
116787	AW362955	Hs.15641	ESTs	hi-lo-hi
118336	BE327311	Hs.47166	HT021	hi-lo-hi
120649	AA687322	Hs.192843	leucine zipper protein FKSG14	hi-lo-hi
121503	AA412049	Hs.290347	ESTs	hi-lo-hi
121748	BE536911	Hs.234545	Homo sapiens NUF2R mRNA, complete cds	hi-lo-hi
122860	AA464414		gb:zx78g01.s1 Soares ovary tumor NbHOT H	hi-lo-hi
123477	AF217515	Hs.283532	uncharacterized bone marrow protein BM03	hi-lo-hi
130338	AI375726	"Hs.279918	hypothetical protein	hi-lo-hi
130680	BE567313	Hs.183109	monoamine oxidase A	hi-lo-hi
131148	AW953575	"Hs.303125	p53-induced protein PIGPC1	hi-lo-hi
131626	BE514605	"Hs.289092	Homo sapiens cDNA: FLJ22380 fis, clone H	hi-lo-hi
131937	AI907735	Hs.21446	Homo sapiens mRNA for KIAA1716 protein,	hi-lo-hi
131965	W79283	Hs.35962	ESTs	hi-lo-hi
132371	AA235448	Hs.46677	PRO2000 protein	hi-lo-hi
133626	AW836130	Hs.75277	hypothetical protein FLJ13910	hi-lo-hi
300942	AW301344	Hs.122908	Homo sapiens, clone IMAGE:3048353, mRNA,	hi-lo-hi
300953	AA542845	Hs.294088	ESTs	hi-lo-hi
302656	BE090580	Hs.70704	Homo sapiens, clone IMAGE:2823731, mRNA,	hi-lo-hi
311928	T62216	Hs.270840	ESTs	hi-lo-hi
313637	AK000742	Hs.126774	L2DTL protein	hi-lo-hi
313832	AW271106	Hs.133294	ESTs	hi-lo-hi
316465	AW574774	Hs.121692	ESTs	hi-lo-hi
317202	AA894880	Hs.181181	ESTs	hi-lo-hi
320771	R74441	Hs.117176	poly(A)-binding protein, nuclear 1	hi-lo-hi
321636	AI820961	Hs.193465	ESTs	hi-lo-hi
330867	AW978991	Hs.221197	ESTs	hi-lo-hi
331442	H77381	Hs.159420	ESTs	hi-lo-hi
106654	AW075485	Hs.286049	phosphoserine aminotransferase	hi-lo-hi
106590	AI350260	Hs.301539	hypothetical protein MGC2633	hi-lo-hi
128460	T16206	Hs.237164	ESTs, Highly similar to LDHH_HUMAN L-LA	hi-lo-hi
114394	T34462	Hs.103291	neuritin	hi-lo-hi
315936	AW069807	Hs.271252	ESTs	hi-lo-hi
108886	AW248434	Hs.91521	hypothetical protein	hi-lo-hi
129241	AI878857	Hs.109706	hematological and neurological expressed	hi-lo-hi
104978	AI199268	Hs.19322	ESTs, Weakly similar to CGHU7L collagen	hi-lo-hi
129626	F13272	Hs.111334	ferritin, light polypeptide	hi-lo-hi
118895	BE304917	Hs.31097	hypothetical protein FLJ21478	hi-lo-hi
332577	AI826268	Hs.27769	ESTs, Weakly similar to MCAT_HUMAN MITOC	hi-lo-hi
116732	AW152225	Hs.165909	ESTs	hi-lo-hi
106774	AI216748	Hs.14587	ESTs, Weakly similar to AF151859 1 CGI-1	hi-lo-hi
108818	BE612676	Hs.303116	stromal cell-derived factor 2-like 1	hi-lo-hi

315618	AI287341	'Hs.154029	bHLH factor Hes4	hi-lo-hi
110561	AA379597	Hs.5199	HSPC150 protein similar to ubiquitin-con	hi-lo-hi
132959	AW014195	Hs.61472	ESTs, Weakly similar to unknown [S.cerev	hi-lo-hi
103195	AA351647	Hs.2642	eukaryotic translation elongation factor	hi-lo-hi
100368	D79987	Hs.153479	extra spindle poles, S. cerevisiae, homo	hi-lo-hi
103177	BE244377	'Hs.48876	farnesyl-diphosphate farnesyltransferase	hi-lo-hi
109141	AF174600	Hs.193380	F-box protein Fbx20	hi-lo-hi
100676	X02761	'Hs.287820	fibronectin 1	hi-lo-hi
100254	AA452181	Hs.77643	FK506-binding protein 1B (12.6 kD)	hi-lo-hi
133688	U71321	Hs.7557	FK506-binding protein 5	hi-lo-hi
107129	AC004770	'Hs.4756	flap structure-specific endonuclease 1	hi-lo-hi
102696	BE540274	Hs.239	forkhead box M1	hi-lo-hi
101753	L11144	Hs.1907	galanin	hi-lo-hi
101597	AA317089	'Hs.597	glutamic-oxaloacetic transaminase 1, sol	hi-lo-hi
133512	L18861		gb:Human Golli-mbp gene, exon 1.	hi-lo-hi
130080	X14850	Hs.147097	H2A histone family, member X	hi-lo-hi
101600	BE561617	'Hs.119192	H2A histone family, member Z	hi-lo-hi
101332	J04088	'Hs.156346	topoisomerase (DNA) II alpha (170kD)	hi-lo-hi
132967	AA316181	Hs.61635	six transmembrane epithelial antigen of	hi-lo-hi
129726	H15474	Hs.132898	fatty acid desaturase 1	hi-lo-hi
106925	AK002011	Hs.37558	hypothetical protein FLJ11149	hi-lo-hi
105643	BE621719	Hs.173802	KIAA0603 gene product	hi-lo-hi
116028	H59799	Hs.42644	thioredoxin-like	hi-lo-hi
105437	AF151076	Hs.25199	hypothetical protein	hi-lo-hi
122512	AF053305	Hs.98658	budding uninhibited by benzimidazoles 1	hi-lo-hi
131991	AF053306	Hs.36708	budding uninhibited by benzimidazoles 1	hi-lo-hi
135015	AW361638	Hs.278338	LGN protein	hi-lo-hi
102208	U22961		gb:Human mRNA clone with similarity to L	hi-lo-hi
100144	AL119964	Hs.75616	seladin-1	hi-lo-hi
100447	NM_014767	Hs.74583	KIAA0275 gene product	hi-lo-hi
116578	D21262	Hs.75337	nucleolar phosphoprotein p130	hi-lo-hi
130350	AA369601	Hs.239138	pre-B-cell colony-enhancing factor	hi-lo-hi
101045	J05614		gb:Human proliferating cell nuclear anti	hi-lo-hi
101544	M31169		gb:Human propionyl-CoA carboxylase beta-	hi-lo-hi
113674	NM_014214	Hs.5753	inositol(myo)-1(or 4)-monophosphatase 2	hi-lo-hi
102260	AL039104	Hs.159557	karyopherin alpha 2 (RAG cohort 1, impor	hi-lo-hi
100154	H60720	Hs.81892	KIAA0101 gene product	hi-lo-hi
100199	BE562298	Hs.71827	KIAA0112 protein; homolog of yeast ribos	hi-lo-hi
100372	NM_014791	Hs.184339	KIAA0175 gene product	hi-lo-hi
100387	D83777	'Hs.75137	KIAA0193 gene product	hi-lo-hi
131514	BE270734	'Hs.2795	lactate dehydrogenase A	hi-lo-hi
102938	W27518	Hs.234489	lactate dehydrogenase B	hi-lo-hi
105811	BE617695	Hs.286192	protein phosphatase 1, regulatory (inhib	hi-lo-hi
101013	BE300094	'Hs.227751	lectin, galactoside-binding, soluble, 1	hi-lo-hi
124148	BE300094	'Hs.227751	lectin, galactoside-binding, soluble, 1	hi-lo-hi
102968	AU076611	Hs.154672	methylene tetrahydrofolate dehydrogenase	hi-lo-hi
130149	AW067805	Hs.172665	methylenetetrahydrofolate dehydrogenase	hi-lo-hi
114767	AI859865	Hs.154443	minichromosome maintenance deficient (S.	hi-lo-hi
129168	AI132988	Hs.109052	chromosome 14 open reading frame 2	hi-lo-hi
105011	BE091926	Hs.16244	mitotic spindle coiled-coil related prot	hi-lo-hi
103023	AW500470	Hs.117950	multifunctional polypeptide similar to S	hi-lo-hi
102808	BE242818	'Hs.179606	nuclear RNA helicase, DECD variant of DE	hi-lo-hi
318617	AW247252	Hs.75514	nucleoside phosphorylase	hi-lo-hi
101568	M81740	Hs.75212	ornithine decarboxylase 1	hi-lo-hi
102076	BE299197	Hs.179665	cyclin-dependent kinase inhibitor 1A (p2	hi-lo-hi
100202	BE294407	'Hs.99910	phosphofructokinase, platelet	hi-lo-hi
101032	BE206854	Hs.46039	phosphoglycerate mutase 2 (muscle)	hi-lo-hi
130553	AF062649	'Hs.252587	pituitary tumor-transforming 1	hi-lo-hi
101626	M57399	Hs.44	pleiotrophin (heparin binding growth fac	hi-lo-hi
101992	X90725	Hs.77597	polo (Drosophia)-like kinase	hi-lo-hi
132164	AI752235	Hs.41270	procollagen-lysine, 2-oxoglutarate 5-dio	hi-lo-hi
101396	BE267931	'Hs.78996	proliferating cell nuclear antigen	hi-lo-hi
119018	AA631143	Hs.179809	ESTs	hi-lo-hi
101840	AA236291	Hs.183583	serine (or cysteine) proteinase inhibito	hi-lo-hi
332640	BE568452	Hs.5101	protein regulator of cytokinesis 1	hi-lo-hi
132543	BE568452	Hs.5101	protein regulator of cytokinesis 1	hi-lo-hi
101118	AA371931	'Hs.77422	proteolipid protein 2 (colonic epitheliu	hi-lo-hi
109166	AA219691	Hs.73625	RAB6 interacting, kinesin-like (rabkines	hi-lo-hi
100830	AC004770	'Hs.4756	flap structure-specific endonuclease 1	hi-lo-hi
107059	BE614410	Hs.23044	RAD51 (S. cerevisiae) homolog (E coli Re	hi-lo-hi
321693	AA227069	Hs.173737	ras-related C3 botulinum toxin substrate	hi-lo-hi
101148	NM_002923	Hs.78944	regulator of G-protein signalling 2, 24k	hi-lo-hi
130567	AA383092	Hs.1608	replication protein A3 (14kD)	hi-lo-hi
103076	NM_001034	Hs.75319	ribonucleotide reductase M2 polypeptide	hi-lo-hi
103131	BE536069	Hs.2962	S100 calcium-binding protein P	hi-lo-hi
102212	AW411491	Hs.75069	serine hydroxymethyltransferase 2 (mitoc	hi-lo-hi
104254	AW411425	Hs.180655	serine/threonine kinase 12	hi-lo-hi
102748	BE018138	Hs.24447	sigma receptor (SR31747 binding protein	hi-lo-hi
102012	BE259035	Hs.118400	singed (Drosophila)-like (sea urchin fas	hi-lo-hi
102522	BE250944	Hs.183556	solute carrier family 1 (neutral amino a	hi-lo-hi
132994	AA112748	Hs.279905	clone HQ0310 PRO0310p1	hi-lo-hi
101971	Z49105	'Hs.289105	synovial sarcoma, X breakpoint 2	hi-lo-hi

126645	AA316181	Hs.61635	six transmembrane epithelial antigen of	hi-lo-hi
103058	X57348	Hs.184510	stratifin	hi-lo-hi
102632	U66618	Hs.250581	SWI/SNF related, matrix associated, acti	hi-lo-hi
103269	AF230662	"Hs.289105	synovial sarcoma, X breakpoint 2	hi-lo-hi
128920	AA622037	Hs.166468	programmed cell death 5	hi-lo-hi
100114	X02308	Hs.82962	thymidylate synthetase	hi-lo-hi
102846	BE264974	Hs.6566	thyroid hormone receptor interactor 13	hi-lo-hi
131877	J04088	"Hs.156346	topoisomerase (DNA) II alpha (170kD)	hi-lo-hi
100866	U14134	Hs.75113	general transcription factor IIIA	hi-lo-hi
133893	AI434699	Hs.77356	transferrin receptor (p90, CD71)	hi-lo-hi
130135	AA311426	"Hs.21635	tubulin, gemma 1	hi-lo-hi
130287	AA479005	Hs.154036	tumor suppressing subtransferable candid	hi-lo-hi
126180	L32977	Hs.3712	ubiquinol-cytochrome c reductase, Rieske	hi-lo-hi
101536	NM_006002	Hs.77917	ubiquitin carboxyl-terminal esterase L3	hi-lo-hi
102687	NM_007019	"Hs.93002	ubiquitin carrier protein E2-C	hi-lo-hi
103556	Z19002	Hs.37096	zinc finger protein 145 (Kruppel-like, e	hi-lo-hi
300022				hi-lo-hi-lo
133015	AJ002744	Hs.246315	UDP-N-acetyl-alpha-D-galactosamine:polyp	hi-lo-hi-lo
129642	NM_001360	Hs.11806	7-dehydrocholesterol reductase	hi-lo-lo
134369	AF207664	Hs.8230	a disintegrin-like and metalloprotease (	hi-lo-lo
300023				hi-lo-lo
125183	AV660804	Hs.301417	AHNAK nucleoprotein (desmoyokin)	hi-lo-lo
101766	M80899	"Hs.301417	AHNAK nucleoprotein (desmoyokin)	hi-lo-lo
133516	BE265133	"Hs.217493	annexin A2	hi-lo-lo
102148	AW162057	Hs.78629	ATPase, Na+/K+ transporting, beta 1 poly	hi-lo-lo
318538	AI750979	Hs.74034	Homo sapiens clone 24651 mRNA sequence	hi-lo-lo
103554	AI878826	Hs.323469	caveolin 1, caveolae protein, 22kD	hi-lo-lo
329365			CH.X_hs gi|5868838	hi-lo-lo
334282			CH22_FGENES.369_12	hi-lo-lo
334891			CH22_FGENES.452_5	hi-lo-lo
335149			CH22_FGENES.499_5	hi-lo-lo
335682			CH22_FGENES.595_2	hi-lo-lo
335756			CH22_FGENES.604_5	hi-lo-lo
303951	AW475081	Hs.172928	collagen, type I, alpha 1	hi-lo-lo
134421	AU077196	Hs.82985	collagen, type V, alpha 2	hi-lo-lo
131101	BE387561	Hs.22981	DKFZP586M1523 protein	hi-lo-lo
124153	AU077333	"Hs.160483	erythrocyte membrane protein band 7.2 (s	hi-lo-lo
103328	AU077333	"Hs.160483	erythrocyte membrane protein band 7.2 (s	hi-lo-lo
322035	AL137517	"Hs.306201	hypothetical protein DKFZp564O1278	hi-lo-lo
301872	H84730	Hs.326391	ESTs, Highly similar to KIAA1437 protein	hi-lo-lo
303820	AB037858	Hs.173484	hypothetical protein FLJ10337	hi-lo-lo
304049	T58155		gb:yb98h03.s1 Stratagene lung (937210) H	hi-lo-lo
304735	AA578453		gb:nm75h11.s1 NCI_CGAP_Co9 Homo sapiens	hi-lo-lo
306999	AI138628	Hs.308058	EST, Weakly similar to zinc finger prot	hi-lo-lo
128789	AW368576	Hs.139851	caveolin 2	hi-lo-lo
132057	AB037858	Hs.173484	hypothetical protein FLJ10337	hi-lo-lo
114795	AB037858	Hs.173484	hypothetical protein FLJ10337	hi-lo-lo
104204	AK001691	Hs.57655	hypothetical protein FLJ10829	hi-lo-lo
105200	AA328102	Hs.24641	cytoskeleton associated protein 2	hi-lo-lo
105493	AL047586	Hs.10283	RNA binding motif protein 8B	hi-lo-lo
107977	AI188161	Hs.144627	ESTs	hi-lo-lo
108880	AA766605	"Hs.47099	hypothetical protein FLJ21212	hi-lo-lo
111157	AL109729	Hs.18948	ESTs, Highly similar to A31026 probable	hi-lo-lo
116202	BE159395	Hs.87089	ESTs	hi-lo-lo
120689	AW134519	Hs.96125	ESTs	hi-lo-lo
121847	AA446628	Hs.2799	cartilage linking protein 1	hi-lo-lo
124182	AI637471	Hs.107801	ESTs	hi-lo-lo
128515	BE395085	Hs.10086	type I transmembrane protein Fn14	hi-lo-lo
130466	W19744	Hs.180059	Homo sapiens cDNA FLJ20653 fis, clone KA	hi-lo-lo
131076	AA749230	Hs.22666	ESTs	hi-lo-lo
131084	NM_017413	Hs.303084	apelin; peptide ligand for APJ receptor	hi-lo-lo
134109	AA348031	Hs.7913	ESTs	hi-lo-lo
300258	AI478933	Hs.188260	ESTs	hi-lo-lo
302767	H94900	Hs.17882	ESTs	hi-lo-lo
312391	R43707	Hs.133159	ESTs, Weakly similar to PIHUSD salivary	hi-lo-lo
312689	AW450461	Hs.203965	ESTs	hi-lo-lo
315715	AI284219	Hs.130749	ESTs	hi-lo-lo
315843	AA679430	Hs.191897	ESTs	hi-lo-lo
322447	AI735759	Hs.52620	integrin, beta 8	hi-lo-lo
322826	AI807883	Hs.201771	ESTs	hi-lo-lo
324867	AI624707	"Hs.5921	Homo sapiens cDNA: FLJ21592 fis, clone C	hi-lo-lo
331336	AA287450	Hs.93842	Homo sapiens cDNA: FLJ22554 fis, clone	hi-lo-lo
331353	AA953006	Hs.88143	ESTs	hi-lo-lo
133063	AI654133	Hs.30212	thyroid receptor interacting protein 15	hi-lo-lo
311034	BE567130	Hs.311389	ESTs, Moderately similar to PT0375 natur	hi-lo-lo
108647	BE546947	Hs.44276	homeo box C10	hi-lo-lo
124955	AA376768	"Hs.324841	hypothetical protein FLJ22622	hi-lo-lo
113923	AW953484	Hs.3849	hypothetical protein FLJ22041 similar to	hi-lo-lo
310557	AI431798	Hs.164192	ESTs, Weakly similar to Y161_HUMAN HYPOT	hi-lo-lo
302943	AI581344	Hs.127812	ESTs, Weakly similar to T17330 hypotheti	hi-lo-lo
128453	X02761	"Hs.287820	fibronectin 1	hi-lo-lo
305232	AA670052	Hs.169476	glyceraldehyde-3-phosphate dehydrogenase	hi-lo-lo

117642	U55184	"Hs 154145	hypothetical protein FLJ11585	hi-lo-lo
115881	NM_005756	Hs.184942	G protein-coupled receptor 64	hi-lo-lo
133666	U56725	Hs.75452	heat shock 70kD protein 2	hi-lo-lo
103262	X78565	Hs.289114	hexabrachion (tenascin C, cytotactin)	hi-lo-lo
100793	S69027		gb:HOX C6=class I homeodomain {fragment	hi-lo-lo
102289	U32114			hi-lo-lo
319109	Z45662	Hs.90797	Homo sapiens clone 23620 mRNA sequence	hi-lo-lo
116357	AF052107	Hs.90797	Homo sapiens clone 23620 mRNA sequence	hi-lo-lo
101497	W05150	"Hs.37034	homeo box A5	hi-lo-lo
105508	AA173942	Hs.326416	Homo sapiens mRNA; cDNA DKFZp564H1916 (f	hi-lo-lo
302290	AA179949	Hs.175563	Homo sapiens mRNA; cDNA DKFZp564N0763 (f	hi-lo-lo
102838	R34657	Hs.80658	uncoupling protein 2 (mitochondrial, pro	hi-lo-lo
100235	D29954	Hs.13421	KIAA0056 protein	hi-lo-lo
133507	NM_002206	Hs.74369	integrin, alpha 7	hi-lo-lo
125573	AI351642	Hs.182241	Interferon induced transmembrane protein	hi-lo-lo
103059	X57351	Hs.174195	interferon induced transmembrane protein	hi-lo-lo
330415	D83777	"Hs.75137	KIAA0193 gene product	hi-lo-lo
303054	BE265848	Hs.289080	colon cancer-associated protein Mic1	hi-lo-lo
133579	X75346	Hs.75074	mitogen-activated protein kinase-activat	hi-lo-lo
100528	BE386801	Hs.21858	trinucleotide repeat containing 3	hi-lo-lo
107480	AF001691	Hs.74304	periplakin	hi-lo-lo
133050	X73424	Hs.63788	propionyl Coenzyme A carboxylase, beta p	hi-lo-lo
133061	AI186431	Hs.296638	prostate differentiation factor	hi-lo-lo
106390	AJ297436	Hs.20166	prostate stem cell antigen	hi-lo-lo
302124	AA676403	Hs.145078	regulator of differentiation (in S. pomb	hi-lo-lo
129823	X00949	"Hs.105314	relaxin 1 (H1)	hi-lo-lo
134444	BE184455	"Hs.251754	secretory leukocyte protease inhibitor (	hi-lo-lo
103240	U81961	Hs.2794	sodium channel, nonvoltage-gated 1 alpha	hi-lo-lo
115761	AA366037	Hs.90911	solute carrier family 16 (monocarboxylic	hi-lo-lo
321412	AI674383	Hs.22891	solute carrier family 7 (cationic amino	hi-lo-lo
126487	AA283809	Hs.184601	solute carrier family 7 (cationic amino	hi-lo-lo
101759	M80244	Hs.184601	solute carrier family 7 (cationic amino	hi-lo-lo
112941	AW163034	Hs.6467	synaptogyrin 3	hi-lo-lo
134351	BE272506	"Hs.82109	syndecan 1	hi-lo-lo
125924	BE272506	"Hs.82109	syndecan 1	hi-lo-lo
130982	AA033627	Hs.21858	trinucleotide repeat containing 3	hi-lo-lo
133473	AW301993	Hs.73980	troponin T1, skeletal, slow	hi-lo-lo
101042	T46839	"Hs.10319	UDP glycosyltransferase 2 family, polype	hi-lo-lo
129565	X77777	Hs.198726	vasoactive intestinal peptide receptor 1	hi-lo-lo
102992	M85430	"Hs.155191	villin 2 (ezrin)	hi-lo-lo
106868	BE185536	Hs.300816	Homo sapiens mRNA; cDNA DKFZp564I172 (fr	lo-hi lo
132818	AL050025	"Hs.279918	hypothetical protein FLJ20151	lo-hi-hi
100187	D17793	"Hs.78183	aldo-keto reductase family 1, member C3	lo-hi-hi
116334	AL038450	Hs.48948	ATP2C1 calcium transport ATPase, same as	lo-hi-hi
134454	NM_013230	Hs.288124	CD24 antigen (small cell lung carcinoma	lo-hi-hi
302067	BE542706	Hs.222399	CEGP1 protein	lo-hi-hi
105500	AW602166	Hs.222399	CEGP1 protein	lo-hi-hi
100732	AA557880	"Hs.76152	decorin	lo-hi-hi
129265	AA530892	Hs.171695	dual specificity phosphatase 1	lo-hi-hi
117789	N48294	Hs.46850	EST	lo-hi-hi
330786	BE379594	"Hs.49136	ESTs, Moderately similar to ALU7_HUMAN A	lo-hi-hi
319808	T58960	Hs.17283	hypothetical protein FLJ10890	lo-hi-hi
303502	BE174240		gb:QV1-HT0573-290200-092-f06 HT0573 Homo	lo-hi-hi
116780	H22566	"Hs.30098	ESTs	lo-hi-hi
104189	AB040927	Hs.301804	KIAA1494 protein	lo-hi-hi
105588	L43821	Hs.80261	enhancer of filamentation 1 (cas-like do	lo-hi-hi
105731	AA834864	Hs.29131	nuclear receptor coactivator 2	lo-hi-hi
105772	H57111	Hs.221132	ESTs	lo-hi-hi
105794	H24530	Hs.273294	hypothetical protein FLJ20069	lo-hi-hi
113098	N77737	Hs.8349	Apobec-1 complementation factor; APOBEC-	lo-hi-hi
113803	AW880709	"Hs.283683	chromosome 8 open reading frame 4	lo-hi-hi
114530	AA601038	Hs.191797	ESTs	lo-hi-hi
116188	AA468183	Hs.184598	Homo sapiens cDNA: FLJ23241 fis, clone C	lo-hi-hi
117330	AI904095	Hs.43423	ESTs	lo-hi-hi
117701	BE063921	Hs.295971	ESTs	lo-hi-hi
120911	AI189754	Hs.144330	ESTs	lo-hi-hi
124083	AW195237	Hs.7734	hypothetical protein FLJ22174	lo-hi-hi
124690	AW883529	Hs.173830	ESTs	lo-hi-hi
130796	AA088809	Hs.19525	hypothetical protein FLJ22794	lo-hi-hi
131524	AB040927	Hs.301804	KIAA1494 protein	lo-hi-hi
132116	AW960474	Hs.40289	ESTs	lo-hi-hi
132442	AW970859	Hs.313503	ESTs	lo-hi-hi
310219	AI221087	Hs.147761	ESTs	lo-hi-hi
310598	AI439136	Hs.140546	ESTs	lo-hi-hi
310884	AW014684	Hs.232189	ESTs	lo-hi-hi
311587	AI828254	Hs.271019	ESTs, Weakly similar to SMN1_HUMAN SURVI	lo-hi-hi
312240	R36475	Hs.24321	Homo sapiens cDNA FLJ12028 fis, clone HE	lo-hi-hi
312803	AA677934	Hs.117864	ESTs	lo-hi-hi
314219	AA262331	Hs.48376	Homo sapiens clone HB-2 mRNA sequence	lo-hi-hi
315052	AA876910	Hs.134427	ESTs	lo-hi-hi
331919	AA446869	Hs.119316	ESTs	lo-hi-hi
133240	AK001489	Hs.242894	ADP-ribosylation factor-like 1	lo-hi-hi

134006	Z45957	Hs.7837	G-protein-coupled receptor induced prote	lo-hi-hi
124847	W07701	"Hs.304177	Homo sapiens clone FLB8503 PRO2286 mRNA,	lo-hi-hi
129087	AI348027	Hs.108557	Homo sapiens clone PP1057 unknown mRNA	lo-hi-hl
131762	AA744902	"Hs.107767	hypothetical protein PRO1489	lo-hi-hi
129000	AA744902	"Hs.107767	hypothetical protein PRO1489	lo-hi-hi
105713	AI122843	"Hs.184319	ESTs, Weakly similar to KIAA1006 protein	lo-hl-hl
118475	N66845		gb:za46c11.s1 Soares fetal liver spleen	lo-hi-hi
118381	N64513	Hs.48994	ESTs, Weakly similar to AF151800 1 CGI-4	lo-hi-hi
105057	AA134233		gb:zo20f10.s1 Stratagene colon (937204)	lo-hi-hl
131507	AI826268	Hs.27769	ESTs, Weakly similar to MCAT_HUMAN MITOC	lo-hi-hi
124970	BE272862	Hs.106534	hypothetical protein FLJ22625	lo-hi-hi
130094	NM_001471	"Hs.167017	gamma-aminobutyric acid (GABA) B recepto	lo-hi-hl
302357	X03178	Hs.198246	group-specific component (vitamin D bind	lo-hi-hi
113231	AA278583	Hs.180737	Homo sapiens clone 23664 and 23905 mRNA	lo-hi-hi
111923	BE383234	Hs.25925	Homo sapiens clone 23860 mRNA sequence	lo-hl-hi
128530	AI932995	Hs.183475	Homo sapiens clone 25061 mRNA sequence	lo-hi-hi
128987	AI339046	Hs.107637	hypothetical protein FLJ12806	lo-hi-hi
315368	AB037745	Hs.104696	KIAA1324 protein	lo-hi-hi
133944	AW068579	Hs.7780	Homo sapiens mRNA; cDNA DKFZp564A072 (fr	lo-hi-hi
115084	BE383668	"Hs.42484	hypothetical protein FLJ10618	lo-hi-hi
132883	AA373314	Hs.5897	Homo sapiens mRNA; cDNA DKFZp586P1822 (f	lo-hi-hi
109623	AW207385	Hs.295901	KIAA0493 protein	lo-hi-hi
130577	M69241	"Hs.162	insulin-like growth factor binding prote	lo-hi-hi
101889	AF188747	"Hs.181350	kallikrein 2, prostatic	lo-hi-hi
130336	AA535210	"Hs.171995	kallikrein 3, (prostate specific antigen	lo-hi-hi
128180	AW949068	Hs.171995	kallikrein 3, (prostate specific antigen	lo-hi-hi
134921	AL137491	Hs.125511	Homo sapiens mRNA; cDNA DKFZp434P1530 (f	lo-hi-hl
302385	AJ224172	Hs.204096	lipophilin B (uteroglobin family member)	lo-hi-hi
117921	AA021459	Hs.306480	Homo sapiens mRNA; cDNA DKFZp761E2112 (f	lo-hi-hi
101701	NM_002436	Hs.1861	membrene protein, palmitoylated 1 (55kD)	lo-hi-hl
130356	AF127577	Hs.155017	nuclear receptor interacting protein 1	lo-hi-hi
101763	AB001914	Hs.170414	paired besic amino acid cleaving system	lo-hi-hl
130342	U81802	Hs.154846	phosphatidylinositol 4-kinase, catalytic	lo-hi-hl
130760	AW379130	Hs.18953	phosphodiesterase 9A	lo-hi-hi
101461	N98569	Hs.76422	phospholipase A2, group IIA (platelets,	lo-hi-hi
134032	NM_005025	Hs.78589	serine (or cysteine) proteinase inhibito	lo-hi-hi
303762	AF034799	Hs.30881	protein tyrosine phosphatase, receptor t	lo-hi-hl
110932	AA021459	Hs.306480	Homo sapiens mRNA; cDNA DKFZp761E2112 (f	lo-hi-hi
135192	U83993	Hs.321709	purinergic receptor P2X, ligand-gated io	lo-hi-hi
133886	U97276	Hs.77266	quiescin Q6	lo-hi-hi
134142	BE244053	Hs.79362	retinoblastoma-like 2 (p130)	lo-hi-hi
100877	X80821	Hs.302177	H.sapiens mRNA for ribosomal protein L18	lo-hl-hl
133534	AU077115	Hs.201675	RNA binding motif protein 5	lo-hi-hl
133011	NM_006379	Hs.171921	seme domain, immunoglobulin domain (Ig),	lo-hi-hi
132160	W26406	Hs.295923	seven in absentia (Drosophila) homolog 1	lo-hi-hi
103110	X62822	Hs.2554	sialyltransferase 1 (beta-galactoside al	lo-hi-hi
130173	U38847	Hs.151518	TAR (HIV) RNA-binding protein 1	lo-hl-hi
127435	X89088	"Hs.288181	Homo sapiens cDNA FLJ13613 fis, clone PL	lo-hi-hi
110520	N54069	Hs.4082	lectin, galactoside-binding, soluble, 8	lo-hi-hi
114660	AA071383		gb:zm61d05.r1 Stratagene fibroblast (937	lo-hi-hi
330541	NM_002038	Hs.285827	interferon, alpha-inducible protein (clo	lo-hi-lo
101486	AA506324	Hs.1852	acid phosphatase, prostate	lo-hi-lo
332386	NM_000481	Hs.102	aminomethyltransferase (glycine cleavage	lo-hi-lo
100569	AA535210	"Hs.171995	kallikrein 3, (prostate specific antigen	lo-hi-lo
134738	AU076801	Hs.89436	cadherin 17, LI cadherin (liver-intestin	lo-hi-lo
103119	X63629	Hs.2877	cadherin 3, type 1, P-cadherin (placenta	lo-hi-lo
302892	AW176909	Hs.42348	calcineurin-binding protein calsarcin-1	lo-hi-lo
105402	AB014680	Hs.8786	carbohydrate (chondroitin 6/keratan) sul	lo-hi-lo
102976	AU077174	"Hs.288181	cathepsin H	lo-hi-lo
101793	W01076	"Hs.119683	CD59 antigen p18-20 (antigen identified	lo-hi-lo
129890	AI868872	"Hs.282804	Homo sapiens cDNA: FLJ22704 fis, clone H	lo-hi-lo
328164			CH.06_hs gi|5868068	lo-hi-lo
328648			CH.07_hs gi|6004473	lo-hi-lo
330032			CH.16_p2 gi|6682596	lo-hi-lo
330033			CH.16_p2 gi|6682596	lo-hl-lo
326816			CH.20_hs gi|6552458	lo-hi-lo
337603			CH22_C20H12.GENSCAN.16-2	lo-hi-lo
338561			CH22_EM:AC005500.GENSCAN.421-5	lo-hl-lo
338562			CH22_EM:AC005500.GENSCAN.421-6	lo-hi-lo
333743			CH22_FGENES.264_1	lo-hi-lo
333845			CH22_FGENES.290_3	lo-hi-lo
333849			CH22_FGENES.290_8	lo-hi-lo
334221			CH22_FGENES.360_1	lo-hi-lo
334222			CH22_FGENES.360_3	lo-hi-lo
334578			CH22_FGENES.406_1	lo-hi-lo
336662			CH22_FGENES.41-1	lo-hi-lo
336684			CH22_FGENES.46-1	lo-hi-lo
335289			CH22_FGENES.527_2	lo-hi-lo
335290			CH22_FGENES.527_3	lo-hi-lo
335293			CH22_FGENES.527_6	lo-hi-lo
337182			CH22_FGENES.570-2	lo-hi-lo
335809			CH22_FGENES.617_6 (same as BFH4)	lo-hi-lo

335810			CH22_FGENES.617_7	lo-hi-lo
335824			CH22_FGENES.619_11 (same as BFH5)	lo-hi-lo
336054			CH22_FGENES.683_3	lo-hi-lo
333124			CH22_FGENES.81_8	lo-hi-lo
332340	AP000692	Hs.129781	chromosome 21 open reading frame 5	lo-hi-lo
130380	AI949359	Hs.143600	type II Golgi membrane protein	lo-hi-lo
102962	R50032	Hs.159263	collagen, type VI, alpha 2	lo-hi-lo
331306	AF102546	Hs.63931	dachshund (Drosophila) homolog	lo-hi-lo
319408	AA448090	Hs.87359	ESTs, Highly similar to RB18 MOUSE RAS-R	lo-hi-lo
312197	T96203		gb:ye48b07.r1 Soares fetal liver spleen	lo-hi-lo
312405	AI523875		gb:tg97d04.x1 NCI_CGAP_CLL1 Homo sapiens	lo-hi-lo
312939	AA495930	Hs.24444	Homo sapiens cDNA: FLJ22165 fis, clone H	lo-hi-lo
313475	AA010200	Hs.175551	ESTs	lo-hi-lo
313624	AA525775	Hs.292523	ESTs	lo-hi-lo
316897	AA838114	Hs.221612	ESTs	lo-hi-lo
317850	AI681545	Hs.152982	hypothetical protein FLJ13117	lo-hi-lo
318541	T30290	Hs.107515	ESTs	lo-hi-lo
321325	AB033100	Hs.300646	KIAA protein (similar to mouse paladin)	lo-hi-lo
321696	AA628791	Hs.76228	amplified in osteosarcoma	lo-hi-lo
322189	H65014		gb:yu66f10.r1 Weizmann Olfactory Epithel	lo-hi-lo
322463	AI242754	Hs.137306	ESTs	lo-hi-lo
322540	R76593		gb:yi60c11.r1 Soares placenta Nb2HP Homo	lo-hi-lo
323131	AK002088	Hs.270124	Homo sapiens cDNA FLJ11226 fis, clone PL	lo-hi-lo
323243	W47525	Hs.110771	Homo sapiens cDNA: FLJ21904 fis, clone H	lo-hi-lo
323591	AA301270		gb:EST14192 Testis tumor Homo sapiens cD	lo-hi-lo
323753	AK002161	Hs.70266	yeast Sec31p homolog	lo-hi-lo
323835	AL042005	Hs.1117	tripeptidyl peptidase II	lo-hi-lo
323926	AA354572		gb:EST62857 Jurkat T-cells V Homo sapien	lo-hi-lo
324047	AI433357	"Hs.271340	ESTs	lo-hi-lo
324330	AA884766		gb:am20a10.s1 Soares_NFL_T_GBC_S1 Homo s	lo-hi-lo
324753	AA612626	Hs.144871	Homo sapiens cDNA FLJ13752 fis, clone PL	lo-hi-lo
300702	AA075481	Hs.111334	ferritin, light polypeptide	lo-hi-lo
301712	BE083080	Hs.274323	Homo sapiens, Similar to sialyltransfera	lo-hi-lo
302380	AA325633	Hs.136102	KIAA0853 protein	lo-hi-lo
302970	W05608	Hs.312679	EST	lo-hi-lo
303187	AA115962	Hs.323423	ESTs, Moderately similar to B Chain B,	lo-hi-lo
303194	AA082000		gb:zn26f07.r1 Stratagene neuroepithelium	lo-hi-lo
305612	AA782347	Hs.272572	hemoglobin, alpha 2	lo-hi-lo
304263	AA062837		gb:zm05b11.s1 Stratagene corneal stroma	lo-hi-lo
304275	AA070605		gb:zm53h09.s1 Stratagene fibroblast (937	lo-hi-lo
304309	AA112147		gb:zm64c06.s1 Stratagene fibroblast (937	lo-hi-lo
305503	AA759177	Hs.298148	ESTs, Weakly similar to KIAA0565 protei	lo-hi-lo
308615	AK000142	Hs.101774	hypothetical protein FLJ23045	lo-hi-lo
309390	AW080585		gb:xc33f09.x1 NCI_CGAP_Co18 Homo sapiens	lo-hi-lo
104667	AI239923	Hs.30098	ESTs	lo-hi-lo
310014	D60745	Hs.25925	Homo sapiens clone 23860 mRNA sequence	lo-hi-lo
318814	W07361	Hs.22545	Homo sapiens cDNA FLJ12935 fis, clone NT	lo-hi-lo
321896	C04863	Hs.47191	ESTs	lo-hi-lo
331661	W52448	Hs.56147	ESTs	lo-hi-lo
332120	AA609684	Hs.112748	Homo sapiens cDNA: FLJ21543 fis, clone C	lo-hi-lo
332256	AW975028	Hs.102754	ESTs	lo-hi-lo
107252	D60745	Hs.25925	Homo sapiens clone 23860 mRNA sequence	lo-hi-lo
112068	AI264847	Hs.22545	Homo sapiens cDNA FLJ12935 fis, clone NT	lo-hi-lo
117929	N51075	Hs.47191	ESTs	lo-hi-lo
119637	W52448	Hs.56147	ESTs	lo-hi-lo
123712	AA609684	Hs.112748	Homo sapiens cDNA: FLJ21543 fis, clone C	lo-hi-lo
124560	AW975028	Hs.102754	ESTs	lo-hi-lo
105039	AA907305	Hs.36475	ESTs	lo-hi-lo
105271	AA807881	Hs.25329	ESTs	lo-hi-lo
106689	AW296584	Hs.293782	ESTs	lo-hi-lo
106849	AL137281	Hs.17110	Homo sapiens mRNA; cDNA DKFZp434C2016 (f	lo-hi-lo
107071	AW385224	Hs.35198	ectonucleotide pyrophosphatase/phosphodi	lo-hi-lo
108218	W57550	Hs.301526	hypothetical protein FLJ13181	lo-hi-lo
110930	BE242691	Hs.14947	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-hi-lo
112098	R44714	Hs.106795	Homo sapiens cDNA FLJ13136 fis, clone NT	lo-hi-lo
112170	BE246743	Hs.288529	hypothetical protein FLJ22635	lo-hi-lo
112902	AL035633	"Hs.129190	Human DNA sequence from clone RP5-1046G1	lo-hi-lo
114877	AW024162	Hs.205125	ESTs	lo-hi-lo
116312	BE379794	Hs.65403	hypothetical protein	lo-hi-lo
116739	H01463	Hs.93534	ESTs	lo-hi-lo
119267	AA064970	Hs.118145	ESTs	lo-hi-lo
120570	AA280679	Hs.271445	ESTs, Weakly similar to ALU1_HUMAN ALU	lo-hi-lo
121176	AL121523	Hs.97774	ESTs	lo-hi-lo
123360	AA532718	Hs.178604	ESTs	lo-hi-lo
123974	NM_015678	Hs.3821	neurobeachin	lo-hi-lo
124777	R41933		gb:yg04f09.s1 Soares infant brain 1NIB H	lo-hi-lo
128046	AA873285		gb:oh68h05.s1 NCI_CGAP_Kid5 Homo sapiens	lo-hi-lo
128666	AA808466	Hs.103395	hypothetical protein FLJ14146	lo-hi-lo
130639	AI557212	"Hs.17132	ESTs	lo-hi-lo
130693	R68537	Hs.17962	ESTs	lo-hi-lo
131756	AA443966	Hs.31595	ESTs	lo-hi-lo
131985	AA503020	Hs.36563	hypothetical protein FLJ22418	lo-hi-lo

132932	AW118826	Hs.6093	Homo sapiens cDNA: FLJ22783 fis, clone K	lo-hi-lo
134696	BE326276	"Hs.8861	ESTs	lo-hi-lo
300967	AA565209	Hs.269439	ESTs	lo-hi-lo
301182	AW291411	Hs.192531	ESTs, Weakly similar to S00754 zinc fing	lo-hi-lo
302595	AI699372	Hs.193247	Homo sapiens mRNA; cDNA DKFZp434A171 (fr	lo-hi-lo
303132	AI929819	Hs.4055	chromosome 21 open reading frame 50	lo-hi-lo
303506	AA340605	Hs.105887	ESTs, Weakly similar to Homolog of rat Z	lo-hi-lo
303654	BE246743	Hs.288529	hypothetical protein FLJ22635	lo-hi-lo
310026	AA278233	Hs.100691	ESTs	lo-hi-lo
310056	AI253072	Hs.145383	ESTs	lo-hi-lo
310353	AI261700	Hs.145544	ESTs	lo-hi-lo
310371	AI262584	Hs.145575	ESTs	lo-hi-lo
310430	AI670843	Hs.200257	ESTs	lo-hi-lo
310438	AW022192	Hs.200197	ESTs	lo-hi-lo
310455	AI277603	Hs.145990	ESTs	lo-hi-lo
310787	AW262580	Hs.147674	KIAA1621 protein	lo-hi-lo
311067	AI587332	Hs.209115	ESTs	lo-hi-lo
311422	F00677	Hs.101316	ESTs	lo-hi-lo
311465	AI758660	Hs.206132	ESTs	lo-hi-lo
312073	AA682393	"Hs.119237	ESTs	lo-hi-lo
312105	T81819	Hs.302251	ESTs	lo-hi-lo
312108	T82331	"Hs.127453	ESTs	lo-hi-lo
312292	AW450103	Hs.151124	ESTs	lo-hi-lo
312313	AW293341	Hs.122505	ESTs, Weakly similar to I38022 hypotheti	lo-hi-lo
312600	AW970985	Hs.290853	ESTs	lo-hi-lo
312800	AI248774	Hs.126707	hypothetical protein FLJ11457	lo-hi-lo
312821	AA699325	Hs.269880	ESTs	lo-hi-lo
313097	AI676164	Hs.204339	ESTs	lo-hi-lo
313166	AI801098	Hs.151500	ESTs	lo-hi-lo
313179	AA927670	Hs.131704	ESTs	lo-hi-lo
313280	AW960454	Hs.222830	ESTs	lo-hi-lo
313689	AI608810	Hs.193288	ESTs	lo-hi-lo
314146	AI827237	Hs.282884	ESTs	lo-hi-lo
314305	AI280112	Hs.125232	Homo sapiens cDNA FLJ13266 fis, clone OV	lo-hi-lo
314456	AI867931	Hs.164595	ESTs	lo-hi-lo
314465	AA602917	Hs.156974	ESTs	lo-hi-lo
314881	AI095087	Hs.152299	ESTs, Moderately similar to ALU5_HUMAN A	lo-hi-lo
314916	AA548906	Hs.122244	ESTs	lo-hi-lo
315043	AA806538	Hs.130732	KIAA1575 protein	lo-hi-lo
315074	AA828284	Hs.136729	Homo sapiens cDNA: FLJ21348 fis, clone C	lo-hi-lo
315214	AI915927	Hs.34771	ESTs	lo-hi-lo
315344	AW292176	Hs.245834	ESTs	lo-hi-lo
315353	AI373949	Hs.279610	hypothetical protein FLJ10493	lo-hi-lo
315439	T78413	Hs.293696	ESTs	lo-hi-lo
315528	R37257	Hs.184780	ESTs	lo-hi-lo
315720	AA292998	Hs.163900	ESTs	lo-hi-lo
315772	AW515373	Hs.271249	Homo sapiens cDNA FLJ13580 fis, clone PL	lo-hi-lo
315841	AW136397	Hs.247572	ESTs	lo-hi-lo
316042	AI469960	Hs.170698	ESTs	lo-hi-lo
316244	AI640761	Hs.224988	ESTs	lo-hi-lo
316345	AW139408	Hs.152940	ESTs	lo-hi-lo
316625	BE540090	Hs.122156	ESTs	lo-hi-lo
316738	AA889055	Hs.123468	ESTs	lo-hi-lo
316868	AI660898	Hs.195602	ESTs	lo-hi-lo
316905	AW138241	Hs.210846	ESTs	lo-hi-lo
317224	X73608	"Hs.93029	sparc/osteonectin, cwcv and kazal-like d	lo-hi-lo
317275	AI809444	Hs.202108	ESTs	lo-hi-lo
317404	AI806867	Hs.126594	ESTs	lo-hi-lo
317488	AW071851	Hs.130628	ESTs	lo-hi-lo
317916	AI565071	Hs.159983	ESTs	lo-hi-lo
317939	AI986208	Hs.244760	ESTs	lo-hi-lo
318486	T23514		gb:seq3329 1-NIB Homo sapiens cDNA clone	lo-hi-lo
319897	N46574	Hs.43838	ESTs	lo-hi-lo
320654	AI160015	Hs.118112	ESTs	lo-hi-lo
320697	N62937	Hs.269109	ESTs	lo-hi-lo
320787	AW088363	Hs.246240	ESTs	lo-hi-lo
321023	AW294316	Hs.125608	ESTs	lo-hi-lo
321899	AW972832	Hs.29468	ESTs	lo-hi-lo
322939	AA101697	Hs.211270	ESTs	lo-hi-lo
323045	AA148950	Hs.188836	ESTs	lo-hi-lo
323091	AI902456	Hs.210761	ESTs	lo-hi-lo
323262	AL133990	Hs.190642	ESTs	lo-hi-lo
323410	AW118683	Hs.154150	ESTs	lo-hi-lo
323645	AW445014	Hs.197746	ESTs	lo-hi-lo
324598	AW972227	Hs.163986	Homo sapiens cDNA: FLJ22765 fis, clone K	lo-hi-lo
324666	T78413	Hs.293696	ESTs	lo-hi-lo
324674	AA541323	Hs.115831	ESTs	lo-hi-lo
324713	AI093930	"Hs.313466	ESTs	lo-hi-lo
324790	AI334367	Hs.159337	ESTs	lo-hi-lo
324804	AI692552		gb:wd73f12.x1 NCI_CGAP_Lu24 Homo sapiens	lo-hi-lo
330728	AI905520	Hs.29672	ESTs	lo-hi-lo
330760	H04588	Hs.30469	ESTs	lo-hi-lo

330776	AW953805	Hs.21887	ESTs	lo-hi-lo
330824	AB037732	Hs.61441	KIAA1311 protein	lo-hi-lo
331028	AI539652	Hs.28338	KIAA1546 protein	lo-hi-lo
331046	N66563	Hs.191358	ESTs	lo-hi-lo
331050	BE007967	Hs.155795	ESTs	lo-hi-lo
331053	AI949841	Hs.183146	ESTs, Moderately similar to ALU1_HUMAN A	lo-hi-lo
331180	R44692	Hs.6640	Human DNA sequence from PAC 75N13 on chr	lo-hi-lo
331313	AA761094	"Hs.80618	hypothetical protein	lo-hi-lo
331337	N74392	Hs.50495	ESTs	lo-hi-lo
331393	AW976438	"Hs.17428	RBP1-like protein	lo-hi-lo
331432	AA262451	Hs.38485	ESTs	lo-hi-lo
331517	AA765603	Hs.180877	H3 histone, family 3B (H3.3B)	lo-hi-lo
331686	AW474960	Hs.182258	ESTs	lo-hi-lo
332002	AI579909	Hs.105104	ESTs	lo-hi-lo
332043	AA371307	Hs.125056	ESTs	lo-hi-lo
332265	AW770320	Hs.222413	ESTs	lo-hi-lo
332314	R41396	Hs.101774	hypothetical protein FLJ23045	lo-hi-lo
131517	AB037789	Hs.263395	sema domain, transmembrane domain (TM),	lo-hi-lo
315352	AA604799	Hs.136528	ESTs, Moderately similar to ALU1_HUMAN A	lo-hi-lo
315498	AA628539	Hs.116252	ESTs, Moderately similar to ALU1_HUMAN A	lo-hi-lo
321489	AI459177	Hs.172759	ESTs, Moderately similar to ALU7_HUMAN A	lo-hi-lo
106099	NM_012068	Hs.9754	activating transcription factor 5	lo-hi-lo
105726	NM_012068	Hs.9754	activating transcription factor 5	lo-hi-lo
319926	AI820719	Hs.154662	DnaJ (Hsp40) homolog, subfamily A, membe	lo-hi-lo
314915	AI673735	Hs.187748	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-hi-lo
315198	AI741508	Hs.186753	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-hi-lo
324302	AW972771	Hs.292471	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-hi-lo
331341	BE541042	"Hs.23240	Homo sapiens cDNA FLJ13496 fis, clone PL	lo-hi-lo
113783	AL359588	Hs.7041	hypothetical protein DKFZp762B226	lo-hi-lo
313552	AI889208	Hs.17283	hypothetical protein FLJ10890	lo-hi-lo
103989	AA315993	Hs.105484	Homo sapiens regenerating gene type IV m	lo-hi-lo
331492	AK001114	Hs.53913	hypothetical protein FLJ10252	lo-hi-lo
110837	H03109	Hs.108920	HT018 protein	lo-hi-lo
330814	AI955040	Hs.265398	ESTs, Weakly similar to transformation-r	lo-hi-lo
312226	AA315703	Hs.199993	ESTs	lo-hi-lo
102034	AI903474	Hs.230	fibromodulin	lo-hi-lo
134671	BE263255	Hs.302749	FK506-binding protein 9 (63 kD)	lo-hi-lo
131083	Y09763	Hs.22785	gamma-aminobutyric acid (GABA) A recepto	lo-hi-lo
309575	AW168096	Hs.169476	glyceraldehyde-3-phosphate dehydrogenase	lo-hi-lo
134332	D86962	Hs.81875	growth factor receptor-bound protein 10	lo-hi-lo
132904	NM_005518	Hs.59889	3-hydroxy-3-methylglutaryl-Coenzyme A sy	lo-hi-lo
302910	N77976	Hs.251577	hemoglobin, alpha 1	lo-hi-lo
133731	N71725	"Hs.272572	hemoglobin, alpha 2	lo-hi-lo
303297	AF070623	Hs.13423	Homo sapiens clone 24468 mRNA sequence	lo-hi-lo
108732	AA258888	Hs.107476	ATP synthase, H+ transporting, mitochond	lo-hi-lo
108731	AA258888	Hs.107476	ATP synthase, H+ transporting, mitochond	lo-hi-lo
302123	AB013452	Hs.144931	ATPase, aminophospholipid transporter (A	lo-hi-lo
131614	AB002438	Hs.29596	Homo sapiens mRNA from chromosome 5q21-2	lo-hi-lo
104933	N94126	Hs.12969	hypothetical protein	lo-hi-lo
302235	AL049987	Hs.166361	Homo sapiens mRNA; cDNA DKFZp564F112 (fr	lo-hi-lo
320574	AL049443	Hs.161283	Homo sapiens mRNA; cDNA DKFZp586N2020 (f	lo-hi-lo
324678	AI990739	Hs.77868	ORF	lo-hi-lo
331022	H03109	Hs.108920	HT018 protein	lo-hi-lo
332430	H25350	Hs.21145	hypothetical protein FLJ22489	lo-hi-lo
330601	U90916	Hs.82845	Homo sapiens cDNA: FLJ21930 fis, clone H	lo-hi-lo
101988	AF221521	Hs.8068	hematopoietic PBX-interacting protein	lo-hi-lo
102859	AL036058	"Hs.76807	major histocompatibility complex, class	lo-hi-lo
101363	M11321			lo-hi-lo
133968	AA355986	Hs.232068	transcription factor 8 (represses interl	lo-hi-lo
332530	M31669	Hs.1735	inhibin, beta B (activin AB beta polypep	lo-hi-lo
317777	NM_014785	Hs.47313	KIAA0258 gene product	lo-hi-lo
100452	D87742	Hs.241552	KIAA0268 protein	lo-hi-lo
112988	NM_014867	Hs.5333	KIAA0711 gene product	lo-hi-lo
320848	AB020691	Hs.198232	KIAA0884 protein	lo-hi-lo
105162	AL133033	"Hs.4084	KIAA1025 protein	lo-hi-lo
133905	AB028974	Hs.137476	KIAA1051 protein	lo-hi-lo
331406	BE176893	Hs.23440	KIAA1105 protein	lo-hi-lo
321441	AF107493	Hs.118498	Homo sapiens LUCA-15 protein mRNA, splic	lo-hi-lo
131913	AW207440	Hs.185973	degenerative spermatocyte (homolog Droso	lo-hi-lo
135424	U67611		transaldolase 1	lo-hi-lo
128506	L40904	Hs.100724	peroxisome proliferative activated recep	lo-hi-lo
330506	AI130740	Hs.6241	phosphoinositide-3-kinase, regulatory su	lo-hi-lo
311251	AI655662	Hs.197698	ESTs	lo-hi-lo
314171	AI821895	Hs.193481	ESTs	lo-hi-lo
106096	AW379378	Hs.170121	protein tyrosine phosphatase, receptor t	lo-hi-lo
133740	AW162919	"Hs.170160	RAB2, member RAS oncogene family-like	lo-hi-lo
119521	W38038			lo-hi-lo
119546	W38169			lo-hi-lo
119559	W38197			lo-hi-lo
133797	AL133921	Hs.76272	retinoblastoma-binding protein 2	lo-hi-lo
305096	AA642964	Hs.163593	ribosomal protein L18a	lo-hi-lo
120256	AA169801	Hs.98710	hypothetical protein	lo-hi-lo

322919	AA178955	Hs.271439	ESTs	lo-hi-lo
300566	R34926	Hs.326392	son of sevenless (Drosophila) homolog 1	lo-hi-lo
330694	AI741617	Hs.108447	spinocerebellar ataxia 7 (olivopontocere	lo-hi-lo
302416	AL120259	Hs.76691	stannin	lo-hi-lo
319289	AA037534	Hs.79059	transforming growth factor, beta recepto	lo-hi-lo
134656	AI750878	Hs.87409	thrombospondin 1	lo-hi-lo
130117	U06641	Hs.150207	UDP glycosyltransferase 2 family, polype	lo-hi-lo
124357	N22401		gb:yw37g07.s1 Morton Fetal Cochlea Homo	lo-hi-lo
108293	AA069155		gb:zm10f11.s1 Stratagene pancreas (93720	lo-hi-lo
108657	BE567753	Hs.132955	BCL2/adenovirus E1B 19kD-interacting pro	lo-hi-lo
108658	AA641695		gb:nr62h10.s1 NCI_CGAP_Lym3 Homo sapiens	lo-hi-lo
331278	AA071383		gb:zm61d05.r1 Stratagene fibroblast (937	lo-hi-lo
108340	AA069820	Hs.180909	peroxiredoxin 1	lo-hi-lo
108679	AA115963	Hs.323423	ESTs, Moderately similar to B Chain B,	lo-hi-lo
108406	AA075424	Hs.325505	ESTs, Moderately similar to HBA_HUMAN HE	lo-hi-lo
114598	AA075601		gb:zm88c05.r1 Stratagene ovarian cancer	lo-hi-lo
108462	AA079347		gb:zm96c06.s1 Stratagene colon HT29 (937	lo-hi-lo
108466	AA079409		gb:zm96h02.s1 Stratagene colon HT29 (937	lo-hi-lo
108489	AA082977		gb:zn07h10.r1 Stratagene hNT neuron (937	lo-hi-lo
330859	AA082977		gb:zn07h10.r1 Stratagene hNT neuron (937	lo-hi-lo
108505	AA083376		gb:zn09g08.s1 Stratagene hNT neuron (937	lo-hi-lo
331283	AA467736	Hs.275437	ESTs	lo-hi-lo
100641	AW068302	"Hs.182183	Homo sapiens mRNA for caldesmon, 3' UTR	lo-hi-lo-hi
100642	AW068302	"Hs.182183	Homo sapiens mRNA for caldesmon, 3' UTR	lo-hi-lo-hi
325889			CH.16_hs gi|5867087	lo-hi-lo-hi
338038			CH22_EM:AC005500.GENSCAN.149-9	lo-hi-lo-hi
338316			CH22_EM:AC005500.GENSCAN.304-2	lo-hi-lo-hi
100999	H38765	Hs.80706	diaphorase (NADH/NADPH) (cytochrome b-5	lo-hi-lo-hi
331131	R54797		gb:yg87b07.s1 Soares infant brain 1NIB H	lo-hi-lo-hi
310955	AI476732	Hs.263912	ESTs	lo-hi-lo-hi
311137	AW207582	Hs.196042	ESTs	lo-hi-lo-hi
311598	AW023595	Hs.232048	ESTs	lo-hi-lo-hi
313070	AI422023	Hs.161338	ESTs	lo-hi-lo-hi
110844	AI740792	Hs.167531	methylcrotonoyl-Coenzyme A carboxylase 2	lo-hi-lo-hi
120328	AA923278	Hs.290905	ESTs, Weakly similar to protease [H.sapi	lo-hi-lo-hi
105914	AW245680	Hs.9701	growth arrest and DNA-damage-inducible,	lo-hi-lo-hi
129389	NM_012445	"Hs.288126	spondin 2, extracellular matrix protein	lo-hi-lo-hi
102759	NM_005100	Hs.788	A kinase (PRKA) anchor protein (gravin)	lo-lo-hi
100168	H73444	Hs.394	adrenomedullin	lo-lo-hi
102348	U37519	Hs.87539	aldehyde dehydrogenase 8	lo-lo-hi
134158	U15174	Hs.79428	BCL2/adenovirus E1B 19kD-interacting pro	lo-lo-hi
133908	AU076820	Hs.325474	caldesmon 1	lo-lo-hi
101883	AU076743	Hs.75613	CD36 antigen (collagen type I receptor,	lo-lo-hi
327821			CH.05_hs gi|5867968	lo-lo-hi
134133	AA262294	Hs.180383	dual specificity phosphatase 6	lo-lo-hi
103000	NM_001975	"Hs.146580	enolase 2, (gamma, neuronal)	lo-lo-hi
109251	AA194776	Hs.85935	EST	lo-lo-hi
315566	AB037810	Hs.18760	KIAA1389 protein	lo-lo-hi
324697	AK000742	Hs.126774	L2DTL protein	lo-lo-hi
306011	AA896986		gb:al06a08.s1 Barstead spleen HPLRB2 Hom	lo-lo-hi
307111	AI174528		gb:an45g10.s1 Gessler Wilms tumor Homo s	lo-lo-hi
106639	AV655272	Hs.20252	novel Ras family protein	lo-lo-hi
106753	AI656166	Hs.7331	hypothetical protein FLJ22316	lo-lo-hi
107974	AW958103	Hs.61712	pyruvate dehydrogenase kinase, isoenzyme	lo-lo-hi
112033	R49031	Hs.22627	ESTs	lo-lo-hi
113816	H46008	Hs.31518	ESTs	lo-lo-hi
116024	AA088767	"Hs.83883	transmembrane, prostate androgen induced	lo-lo-hi
116158	AA381807	Hs.61762	hypoxia-inducible protein 2	lo-lo-hi
119071	R31180		gb:yh62b02.s1 Soares placenta Nb2HP Homo	lo-lo-hi
120132	W57554	Hs.125019	ESTs	lo-lo-hi
120655	AA305599	Hs.238205	hypothetical protein PRO2013	lo-lo-hi
122411	AW172356	Hs.99083	ESTs	lo-lo-hi
320779	AA815354	Hs.169898	ESTs	lo-lo-hi
321024	AW246216	Hs.32058	Homo sapiens C1orf19 mRNA, partial cds	lo-lo-hi
321408	AW081530	Hs.137088	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-lo-hi
323620	AA306997	Hs.268362	ESTs, Weakly similar to hypothetical pro	lo-lo-hi
314946	AI097229	Hs.217484	ESTs	lo-lo-hi
320683	AA334511	Hs.26638	ESTs, Weakly similar to unnamed protein	lo-lo-hi
128959	AI580127	Hs.107381	hypothetical protein FLJ11200	lo-lo-hi
128896	T53925	Hs.107	fibrinogen-like 1	lo-lo-hi
133592	AV652066	Hs.75113	general transcription factor IIIA	lo-lo-hi
103245	BE566343	"Hs.28988	glutaredoxin (thioltransferase)	lo-lo-hi
314785	AI538226	Hs.32976	guanine nucleotide binding protein 4	lo-lo-hi
103677	Z83806		gb:H.sapiens mRNA for axonemal dynein he	lo-lo-hi
131170	NM_014253	"Hs.23796	odz (odd Oz/ten-m, Drosophila) homolog 1	lo-lo-hi
131164	AW013807	Hs.182265	keratin 19	lo-lo-hi
100409	D86957	Hs.80712	KIAA0202 protein	lo-lo-hi
133167	AW162840	Hs.6641	kinesin family member 5C	lo-lo-hi
319080	AW967646	Hs.23023	ESTs	lo-lo-hi
330706	AF097994	Hs.301528	L-kynurenine/alpha-aminoadipate aminotra	lo-lo-hi
104052	NM_002407	Hs.97644	mammaglobin 2	lo-lo-hi
100547	M57417		gb:Homo sapiens mucin (mucin) mRNA, part	lo-lo-hi

103145	X66276	Hs.169849	myosin-binding protein C, slow-type	lo-lo-hi
301015	AV655272	Hs.20252	novel Ras family protein	lo-lo-hi
311013	AA224760	"Hs.153	ribosomal protein L7	lo-lo-hi
132050	AI267615	Hs.38022	ESTs	lo-lo-hi
132349	AW975654	"Hs.181286	serine protease inhibitor, Kazal type 1	lo-lo-hi
130889	AW972512	Hs.20985	sin3-associated polypeptide, 30kD	lo-lo-hi
130791	AF030403	Hs.199263	Ste-20 related kinase	lo-lo-hi
130385	AW067800	Hs.155223	stanniocalcin 2	lo-lo-hi
127229	AA316181	Hs.61635	six transmembrane epithelial antigen of	lo-lo-hi
133820	S69681	"Hs.177582	surfactant, pulmonary-associated protein	lo-lo-hi
129523	M13231	Hs.274509	T cell receptor gamma constant 2	lo-lo-hi
321415	BE621807	Hs.3337	transmembrane 4 superfamily member 1	lo-lo-hi
131859	AW960564	"Hs.3337	transmembrane 4 superfamily member 1	lo-lo-hi
133444	M63978	Hs.73793	vascular endothelial growth factor	lo-lo-hi
332567	AW939251	"Hs.25647	v-fos FBJ murine osteosarcoma viral onco	lo-lo-hi
131328	AW939251	"Hs.25647	v-fos FBJ murine osteosarcoma viral onco	lo-lo-hi
315901	AI521558	Hs.7331	hypothetical protein FLJ22316	lo-lo-hi
104394	AA129551	Hs.172129	Homo sapiens cDNA: FLJ21409 fis, clone C	lo-lo-hi
103739	AA115173		gb:zn30d02.s1 Stratagene neuroepithelium	lo-lo-hi
103797	AA080912		gb:zn04d03.r1 Stratagene hNT neuron (937	lo-lo-hi
103804	AA129196		gb:zn29d08.r1 Stratagene neuroepithelium	lo-lo-hi

TABLE 18

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT Number	Accessions
108462	116651_1	AA079347 AA079506 AA079538 AA079442
108489	118662_1	AA082977 AA082955 AA082956
101216	17379_1	AA284166 AA314707 L25876 L27711 AA092745 N92087 U02681 AA315766 BE385121 AA352693 NM_005192 AI739135 AI066521 AW173105 AA257103 AA450169 AW261971 AA305065 AI954494 AW950384 AW732122 AA830348 AA789097 AA777794 AA284072 BE564465 AI005313 AA804528 AI041134 AI700317 AI352491 AA856987 AA769007 AA494334 AA769862 AA831168 AI143496 BE090796 AA831166 AI141222 AI372907 N64843 AI075136 AI076701 AA464156 AI076409 AI273523 AA627383 BE043332 T96666 AA158102 AA158059 AW340182 AA257019 AI206700 AI678081 AA757304 AA055005 AW059834 AL039012
131328	8509_1	AW939251 NM_005252 AU076596 V01512 V01512 AW579056 AA249247 AI590359 AW510478 AW518282 BE046054 AW874080 AI268596 AA996237 AI695592 AI244117 AA290764 AA401957 AA505878 AA428304 W74018 W74016 AA040944 AI272071 AA745909 AA620979 AA019816 AI245094 AW009706 AA662536 AW024264 AI268601 AA932024 AW513222 AW024169 AI659705 AA932526 AA975329 AI567603 AI889320 AA514238 AA020837 AI623966 AA843677 AA477453 AA496353 AW372625 AV656426 K00650 W96348 N62388 R95977 AA434270 AI093633 T27639 AW960245 AW881177 R15253 N36936 F07701 AA319315 AA337290 AA284642 AA344052 F05184 AA351062 AA378451 AW794233 AW884380 N36951 R49879 AB022276 AA300350 AW839435 AW191708 BE220350 AA280404 AA485546 AW794235 AV654223 AW838891 AA295986 N72823 AA335648 AA371089 AW845414 H63166 R12840 AA379680 AA477579 R13148 H71003 H71015 AA362156 AW750674 AW845415 AA366924 AW608044 AI570388 R31511 R33906 R33921 AW663022 AW360985 AI207838 AW607239 AI672451 AI573282 AW794752 AA370328 AW998896 AW797239 AW998912 AW794742 AI954543 AI810067 AW073373 AA370325 AW195330 C18106 AW998736 R79476 AA429721 AI891081 AI381534 AW022137 AW020000 AI630329 N99428 AI870222 AI971257 AI922196 AI857753 AW579397 D56749 AI925005 AI685727 AW805573 AI982678 AI784604 AI005625 AW877772 AI634947 AI950829 AA493243 BE166086 AI801820 AI925643 AI627992 AW316704 AI261318 D57757 AA887178 AW770406 AI972075 AI222254 AI675794 D58060 AI701954 D58166 AI799500 AW805669 AW276098 AW874253 AI962991 AI248184 AW996924 AI017462 AW022260 AI885957 BE176841 AA878863 AI697419 AW662094 AI479529 BE177025 D57403 AA507952 AW664593 AW800998 AI985773 AA566089 AA442759 AI624670 AI460284 AI800205 AI537788 AI537593 AI244382 AA583463 AA922678 AA864382 AI610837 D58070 AA844283 AA947992 N73801 AI453821 D58184 AI678887 AW243755 AA746085 D57742 AA757380 R44148 AA496403 BE180303 AW363528 BE006616 D57395 AW805507 AW805511 AA617991 AI373585 H30122 D57744 AW805501 D57691 D58148 AW873164 AW768483 D57601 AA777812 AA837997 BE180123 D57599 AA485387 AW022208 D58096 N67917 W95944 AW805506 D57518 D57990 AI074096 D56521 D58151 AA428720 D56648 D57778 AW805504 D57750 D58108 AW021706 D57449 D57041 D58277 D56935 AI356974 D57023 AA018712 H27631 D57851 D57514 D57268 D57468 AW805646 AI278945 D57323 D56986 D57539 D57829 D58078 AW805515 AI348684 D57772 R74449 BE041558 D56746 AW798485 D56640 AA985597 D56702 D56849 D56874 AW581419 AA470397 D57591 AW798984 T27640 N66497 D56803 AA618186 AW805647 D57945 N23726 D56637 N23730 D56992 BE176882 BE176839 BE176909 D56757 N68137 D56987 AI559806 AA631437 D57464 D56718 C17030 T29278 D57377 AW021936 AW118330 AA515358 D56610 AA494092 D56934 T97774 AI473546 R74350 R84834 AA579200 D56616 C03207 D57391 N52416 D56928 R79209 D56925 AA020879 D45546 AI858769 R20750 T09381 F01435 AW627906 D58202 AI933993 F01912 H27552 AA174191 T16515 AW023216 AA434146 H83387 AI346751 V01512 V01512 AA576407 AW365140 AA937471 BE174681 AI568829 AI274663 R85530 AL048225 H83388 AW798734
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		W42964 AA384428 AW994316 H95163 H95158 R33688 W46557 AW748451 AA029916 AA463826 AA314287 R23084 AA368891 H02926 AA310456 H03632 C02397 R63745 H94539 R32226 R24648 H44502 AA039671 AA345336 W42846 R48024 R79724 R63143 AA379513 R21780 R80704 T70422 H21580 H46388 R62779 AA579734 N64111 AA344527 AI865473 R66666 Z20058 T52284 H95103 R36513 R21874 R31363 AA220939 BE439695 AI189683 AA164901 AI539383 AA768249 AA442361 W02867 AA303315 AW952009 AA314544 AI076799 AA216780 T70338 AA039672 AW629489 AL044620 AA533203 AA043082 AI668619 AW298204 AW195268 AI391606 AA437282 AW304801 AW085720 W02586 AA863279 T82339 AI356879 BE464557 AI038992 AI190018 BE146083 AI860399 AI039572 AI129687 AW468134 AI436074 AI963509 AI682239 AW663467 AW129557 AA680298 AA460262 H91217 N57879 R66069 N95684 AA040855 AA227116 N94486 H04229 H97877 AI161080 AI074367 AI025767 AI754185 AA888150 AI356979 R79463 AA029917 R69637 AI810134 AA460820 AI377990 AI743170 AA854637 AA628548 AA664223 AI362196 AA489363 AI361404 AI363155 AA300504 AI678269 AA633851 H61743 AI161012 AW339721 W42847 W46558 AA143120 AI042475 AA479365 AA219592 AW468142 H67690 AI186516 AA531387 AA835378 H03030 T68119 H95133 AL040491 AI289149 R63701 R32177 R32865 AI811374 AI613274 AA775300 AW192882 R37509 W42965 R47918 AI949525 AI129450 H49378 AI435907 AI832271 AA479271 R21849 H03633 AI888539 C75673 AI261394 AA614478 AW469307 AI261429 W03148 AW026141 AW236371 R79725 AA346568 C06197 T27764 H59538 AI749196 AA485299 AA719227 AI698762 N70790 AI925028 R21734 AA977432 H77905 AI625648 AA918868 AI220069 AI352568 AA668729 AA195395 T63334 AI932783 N32271 R26048 H90697 R24539 AI970287 T55374 N93019 T11162 AA377400 AW882126 AA602293 F35923 AI424237 AI826517 H27442 AA039729 AA382630 AI567304 AA045112 T57779 AI474576 AI352569 R63095 H44456 X85116 AI521609 AA164352 BE146079 H60082 AI334776 AA700506 AA782742 R67386 R22978 R33584 R67011 R80705 AI245311 H81590 AI360786 AI219244 R39564 H66850 AI184385 AA687691 H68013 AA092081 AI445480 AW005734
100641	28620_1	AW068302 AI754558 AI750727 AI752631 AA302174 AA327522 M64110 AW859944 AW859989 AI751995 AA769620 AI858829 AI924875 AI888836 AA864291 AI685060 AW088029 AI924908 AW466328 AI093800 AA991651 AI254501 BE004703 AA334442 AW938852 AA194330 AL046953 AA852866 AW391995 W30846 AW662928 W25261 AA042863 R99045 H97060 W03910 H94687 T88984 AL048165 T29632 N31556 N36484 AI798679 AA989355 W23832 AA873789 AI743648 AA363587 AI814748 AW338990 N73740 N83668 AL047816 R24137 R63433 AA524984 AA234043 AA195131 N99903 AA453669 AI240302 AA370271 AI950026 AW771049 AA121476 AA569557 AI752632 AI355594 AI471993 AI159941 N94555 AI753138 N21537 H97881 N25769 AW068044 AA808425 R63380 AA384736 AA384738 AA852352 AI073645 AA527960 AA525036 AA044414 AI752460 AA703064 R01218 AA897183 AI751998 T81078 H95047 AA573642 D58348 N20953 AA437143 N95439 AA579540 AW867056 AA770090 AI085180 AI806799 AA426421 AI572513 R24081 AA853189 AA295620 AA234044 AA371020 AW994984 H20896 AW964438 AA318516 AA318499 AA318727 AA318211 AA318478 AA318444 AA318307 AA318497 AA318448 AA318309 AA318496 AA318213 AA318435 AA318424 AA318217 AA318523 AA318438 AA318487 AA318724 AA593185 AW994985 T69842 AI251813 AA478174 AA447737 T68350 F07712 AA121145 H08973 AA345212 BE000667 AW068210 AW608407 R05674 H16712 N85426 N42354 H85516 BE147991 T28113 R32662 AA384678 AW239275 H82382 AW840700 D58229 C04082 W45394 AW795667 R73973 BE002409 AA042828 AA363555 AJ223812 AA344709 BE149590 R70995 W46881 W90778 N71242 AA534828 AL040678 R23797 H96450 AA062957 D79947 W46960 AW959278 AA295997 AA026215 AW579469 AW365135 AW365134 AW994353 AW972886 AW069166 AA343690 AW888731 AI751527 AA937490 AA937506 AI826715 BE465604 AI925532 AI858109 AW339097 AI858524 AI720571 BE046506 AW384981 AA043908 AA375983 AA525181 AW068366 AW070577 AW891837 N83985 AW182753 AI422979 AI679733 BE006555 AL048166 AI081401 AI888821 AI626043 N37087 AI624140 AI801298 AA600048 AI753947 H89615 N66424 AW069756 AI814880 AI982806 AI754287 AI971816 AW069022 AW069069 AW069454 AA342989 AI077712 AI311467 AI087361 AI801015 W46993 AI281324 AW191963 AI421675 AI300881 AI356670 AA873156 AI004219 AI189685 AA478018 AA076063 AI445222 AI753124 AI521569 AI925028 AI022368 AI475993 H20846 AI223234 AI635123 AA579170 N30442 AW117889 AA807935 AA558975 AI306636 AA888963 AI952591 AI935835 AI445293 H16713 AW139833 AA622122 AA972051 AI280828 H09543 AI453725 AW069613 AI865615 AI753921 AI368782 AI633208 AI446651 W46961 N22201 H82276 C16555 AA291477 AW440535 AW517755 AA669921 AI926777 AW662118 AA553369 N67873 AW023948 C15861 C16601 AI251465 AW079187 BE045090 AI273006 C16390 C16503 AI620823 F13661 N66864 Z21311 C16108 C16089 C16400 AA758273 AI287781 AA864676 AW608074 AW385583 AI589944 AA665817 AW192979 AW469065 AA564048 H84715 C16417 AA731072 AA661674 C16487 N29477 AW189997 AI370492 C16471 AA652809 AA936687 AA506512 C16306 AW028413 AI537935 AA528347 C16255 AW029046 C16202 AI868152 AI524662 T94414 AI567041 AI619654 AW008486 AI075624 AA577434 AA345104 T30105 AA932002 C16585 AI750390 AW294265 AI619552 AA669781 AA026678 AW132002 AW263919 C16562 AA759137 AA693351 Z40779 C16577 AA885045 AW073763 R45484 AI520895 U54708 T49285 AI568126 AW006569 AI093317 AL119781 T61046 AI053563 H51958 AF114144 AA305739 AW950394 AW793928 AW793910 AL047737 AV659047 AV659632 AI750389 AA092053 AA092798 H85367 T61597 R23745 Z20418 T78485 AI751528 AW068121 AA853188 AI752459 AA853711 AW950663 R78964 R36359 R21626 R21522
100642	28620_1	AW068302 AI754558 AI750727 AI752631 AA302174 AA327522 M64110 AW859944 AW859989 AI751995 AA769620 AI858829 AI924875 AI888836 AA864291 AI685060 AW088029 AI924908 AW466328 AI093800 AA991651 AI254501 BE004703 AA334442 AW938852 AA194330 AL046953 AA852866 AW391995 W30846 AW662928 W25261 AA042863 R99045 H97060 W03910 H94687 T88984 AL048165 T29632 N31556 N36484 AI798679 AA989355 W23832 AA873789 AI743646 AA363587 AI814748 AW338990 N73740 N83668 AL047816 R24137 R63433 AA524984 AA234043 AA195131 N99903 AA453669 AI240302 AA370271 AI950026 AW771049 AA121476 AA569557 AI752632 AI355594 AI471993 AI159941 N94555 AI753138 N21537 H97881 N25769 AW068044 AA808425 R63380 AA384736 AA384738 AA852352 AI073645 AA527960 AA525036 AA044414 AI752460 AA703064 R01216 AA897183 AI751996 T81078 H95047 AA573642 D58348 N20953 AA437143 N95439 AA579540 AW867056 AA770090 AI085180 AI806799 AA426421 AI572513 R24081 AA853189 AA295620 AA234044 AA371020 AW994984 H20896 AW964438 AA318516 AA318499 AA318727 AA318211 AA318478 AA318444 AA318307 AA318497 AA318448 AA318309 AA318496 AA318213 AA318435 AA318424 AA318217 AA318523 AA318438 AA318487 AA318724 AA593185 AW994985 T69842 AI251813 AA478174 AA447737 T68350 F07712 AA121145 H08973 AA345212 BE000667 AW068210 AW608407 R05674 H16712 N85426 N42354 H85516 BE147991 T28113 R32662 AA384678 AW239275 H82382 AW840700 D58229 C04082 W45394 AW795667 R73973 BE002409 AA042828 AA363555 AJ223812 AA344709 BE149590 R70995 W46881 W90778 N71242 AA534826 AL040678 R23797 H96450 AA062957 D79947 W46960 AW959278 AA295997 AA026215 AW579469 AW365135 AW365134 AW994353 AW972886 AW069166 AA343690 AW888731 AI751527 AA937490 AA937506 AI826715 BE465604 AI925532 AI858109 AW339097 AI858524 AI720571 BE046506 AW384981 AA043908 AA375983 AA525181 AW068366 AW070577 AW891837 N83985 AW182753 AI422979 AI679733 BE006555 AL048166 AI081401 AI888821 AI626043 N37087 AI624140 AI801298 AA600048 AI753947 H89615 N66424 AW069756 AI814880 AI982806 AI754287 AI971816 AW069022 AW069069 AW069454 AA342989 AI077712 AI311467 AI087361 AI801015 W46993 AI281324 AW191963 AI421675 AI300881 AI356670 AA873156 AI004219 AI189685 AA478018 AA076063 AI445222 AI753124 AI521569 AI925026 AI022368 AI475993 H20846 AI223234 AI635123 AA579170 N30442 AW117889 AA807935 AA558975 AI306636 AA888963 AI952591 AI935835 AI445293 H16713 AW139833 AA622122 AA972051 AI280828 H09543 AI453725 AW069613 AI865615 AI753921 AI368782 AI633208 AI446651 W46961 N22201 H82276 C16555 AA291477 AW440535 AW517755 AA669921 AI926777 AW662118 AA553369 N67873 AW023948 C15861 C16601 AI251465 AW079187 BE045090 AI273006 C16390 C16503 AI620823 F13661 N66864 Z21311 C16108 C16089 C16400 AA758273 AI287781 AA864676 AW608074 AW385583 AI589944 AA665817 AW192979 AW469065 AA564048 H84715 C16417 AA731072 AA661674 C16487 N29477 AW189997 AI370492 C16471 AA652809 AA936687 AA506512 C16306 AW028413 AI537935 AA528347 C16255 AW029046 C16202 AI868152 AI524662 T94414 AI567041 AI619654 AW008486 AI075624 AA577434 AA345104 T30105 AA932002 C16585 AI750390 AW294265 AI619552 AA669781 AA026678 AW132002 AW263919 C16562 AA759137 AA693351 Z40779 C16577 AA885045 AW073763 R45484 AI520895 U54708 T49285 AI568126 AW006569 AI093317 AL119781 T61046 AI053563 H51958 AF114144 AA305739 AW950394 AW793928 AW793910 AL047737 AV659047 AV659632 AI750389 AA092053 AA092798 H85367 T61597 R23745 Z20418 T78485 AI751528 AW068121 AA853188 AI752459 AA853711 AW950663 R78964 R36359 R21626 R21522
100656	10385_1	BE250162 BE296056 NM_002439 U61981 AA421716 AA723916 N32298 H99382 AI817671 AW364509 AW364468 BE250719 AW364498 AW993728 AA382889 AW473270 N44579 BE514508 BE514324 AW069265 AA969963 J00140 AW575796 AA314334 AL040147 R01547 T91432 T29009 W47530 AI242555 AI379077 AI272820 AI467802 AI827163 AI221263 AW592425 AI472183 AI740752 AW044683 BE467755 AA427637 J00146 AA252992 AI784131 AA694127 AI352150 AA290600 AI040148 AI090860 AA215695 AA227746 AI040147 AA401306 AI332971 AI187739 AW013865 AA010576 AA699792 AI131225 AA700469 R91775 AA778381 AA455309 R00884 T91344 AA682438

		AW821327 AA290577 AW864100 BE397831 H25209 BE397236 AW821317 BE253372 J00139 X00855 V00507 BE252613 BE250809 BE256056 BE391734 BE295309 AA031848 J04810 AA749344 AA489055 AA129465 AA280816 AA280833 AI803332 AW572941 AW572255 AA725857 AI184392 AI635482 AI186480 AA463881 NM_000791 AA447680 AI830697 H94631 AA129464 BE071304 W23580 AA742541 AA651836 AW885001 AW026548 AI361777 AA665122 AI359154 AI039319 AA423962 AI469383 AI262751 AA134941 AI138260 AI003995 AI096798 N80705 AA292482 AI436158 AI695673 AI141920 AA932994 AI880434 AI131169 AA424790 AW024376 AA707045 AA557160 N73567 AW051136 AI419234 AI423410 AI919237 AI626046 AI359605 AI421996 AI375347 AI394460 AA426588 H79646 AA423961 W07757 AA447831 AA348708 BE566659 AA463389 AW951651 T28939 AA488803 AA307107 AA281033 AA280993 AW408089 F06483 BE541506 W03282 AA454921 N90189 AA701106 AA516401 AA578546 AI093830 AA481792 AW176093 AW845531 AA639142 AI271794 AW104373 AA834961 AA927195 AI274416 AA664231
124182	437383_1	AI637471 AW511357 AI375047 AA868500 AI125413 AA913457 H48062 AI218202 H80118 W58272 AI243058 AI086307 AW470886 AA757972 AW594655 AI652038 AI652469 H58711 W58271 H78877 H47710 H58321
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100676	21764_1	X02761 AL134153 U60067 M27589 H12552 AI750806 AW069698 H00678 T92951 AA156457 T53448 R77777 T47375 AV653325 T60421 W61256 T47700 AI752874 AA116119 AW150500 R46471 R42093 R44355 R62662 R44189 AW813264 T63601 R32764 AW069338 AW023601 AW020233 AA946739 AI752245 AW191877 D58570 AI754285 AI886146 AA342911 AI139349 AW994835 AW263386 AW994830 T65787 C18724 U42404 AW378684 AW580570 BE174525 AA600101 AW750611 AI356556 AI750644 T47699 R81772 T49245 T93048 R36450 T49421 AW390369 AA082805 BE142984 AA129277 N83780 AI370335 H43251 AA330915 R23404 AA367947 AW608529 W25319 AA935923 AA092761 H75833 R15348 AI750474 T78889 R62612 T53447 U41850 U42455 AW947480 W25621 R21374
130760	7278_1	AW379130 BE465904 AA502909 AA558701 AI140490 AA551857 AI814897 AA954355 AA535891 AW131779 AA157947 AA128997 AA160913 AA764907 R45187 AW341841 AF048837 NM_002606 AF067223 AB017602 R19767 AI243073 R00719
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130791	30310_1	AF030403 AF099989 NM_013233 AW104402 AA251775 AA251558 AI582744 AI222132 AI351849 AA150838 AA905073 AA278308 AI830043 AI803232 AI813651 AI858774 AI266366 AA286879 AA587082 AI351439 AI080241 AI873470 AI276052 AI392761 AI018158 AW195899 AW274293 AW592760 AA913004 AI936691 AA766905 AA648820 AA824515 AI016857 AA815184 AA642482 AA150717 AA332969 AA286878 AA252004 AU076675 AW385077 AA278967 N85454 AW962882 AA370646 AA371056 AF017635 AA456870 AW362582 AA252778 AA166734 AA251679 R05575 AA393093 N55715 H44200 AA262918 AA411926 H85277 N36353 AA354228 AW957757 AA259102 AA094456 AW804671 AW804977 AA403132 AI983218 AA352380 AA167014 AA367293 AW966089 H87960 AI760615 AI769538 AW020706 AI688310 AW880661 BE465009 AW589896 AW665595 AI421959 N30009 AW500278 AI919235 AA769807 AA628477 AI380646 AW182590 AW152645 BE221635 AI286193 AI819216 H99684 H40111 AI364374 AW148894 AI859448 AI823672 AI797861 N55753 AW962710 AA369410 AI453773 BE464221 AA017250 AA403159 AI359893 AI214320 AI420787 H88348 AI669286 AI272326 AW591912 AW513903 AW085975 AI363885 Z40728 AA977370 H84871 R05469 AA525482 H44199
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109166	12792_1	AA219691 AF153329 AA179617 AF070672 NM_005733 AA157866 AA157567 AW672662 AW383906 AW975835 AI655312 AI653243 AA731744 AI889338 AA704870 AW590208 AI671173 AA781842 BE090424 AI669341 AI203090 AW103151 AI654412 AI168283 AI014854 AW075406 AA600977 AA736497 AA179845 AW074368 AA630744 AA789069 AW770138 AW074752
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100732	14471_11	AA557660 N72931 N58682 AK000553 BE616891 BE019441 BE386392 BE617032 AW955142 BE393778 BE614877 AA312756 AF110136 AA308526 AW954708 BE206037 AA862635 AA877204 W93172 AF086486 W93044 AI696392 AI572790 AW296863 AK000953 BE018623 BE617555 W44531 W44532 AW080328 AV658478 F07038 R13156 N94232 AA497078 AW612145 AI095558 AA347381 R92530 AI686040 AI658722 AW068202 H25028 AI953342 AI868754 AI801162 AI140936 W01221 R11347 R21880 H49230 W03324 H11866 AL355731 AV647641 AL042027 AW949467 AA545748 AV647629 AA332120 AA663188 H64362 H58063 D55343 N85086 T81202 AA092966 D55265 AA344264 D53343 R05625 AA852293 AA347291 AA130059 AL044351 AA375416 C04566 AW239018 AI751674 AA346638 AA346997 AA332827 AA346694 AA361969 AA332692 AA332580 AA333328 AA489969 AA344148 AA347995 AA331488 AA330021 AA330267 AA341439 AA347374 AW662969 AA334856 R57854 AI873152 M14219 NM_001920 R17522 W76610 W03199 L01131 AF138300 R87181 AW242264 W30712 H43945 AW747972 AA564201 R83636 AI569141 AA225474 AA455154 AA100348 T54141 AA329561 AA452455 H12824 T68312 AW512798 AI446779 AW152579 F00576 AA598475 AW337220 AI863890 AI216596 R41889 AI141927 AW382271 H28491 N78364 AA634355 AI754556 R25631 H51724 AA598793 H03280 AW382277 AA485695 AA045260 R74254 AI898875 AI962914 AW950369 N70110 AA779030 N95789 AI679464 AI371134 AW862655 AI371125 AI282869 N99052 AW969704 AA916595 AA026628 AA086334 AI339836 AI051715 AA703328 AI808534 AW244107 BE439440 AI354525 AW193117 AI087238 AI589285 AA778065 AA778055 T50574 N62598 R11200 AA620910 AI453739 AI922832 AI083988 R27013 W68196 R01129 AI627480 AW068113 AI754627 AI147036 R05517 AI380559 AI817283 AW007288 AV658015 N69307 F27591 F27593 AI337979 AI582893 AW072368 AA483079 AW130479 C21314 D45487 AW152570 AI860188 W79127 AI866692 R22174 AW072402 AI589431 AI829367 T41249 AW518805 AW169487 AI624605 AI702017 AA327896 AI963416 AI890113 R77374 N78783 AI936044 AI815020 AW242018 AW192368 AI935852 AI571587 AI420021 AW471274 H66838 F17559 AW196100 H60838 R41887 AW150321 W72648 AW471369 AW262984 AI446080 AI920900 AI801261 AI636202 AW272222 AA937821 W44950 AA722200 AI690574 AW514960 AW382654 AW519092 AA573520 AI684168 AA364847 AW262921 AI921640 AW470209 AW474239 AW190673 AW872977 AA582570 BE222328 AI446657 AW572556 N67217 AW613423 AW471053 AA604746 AI246144 AW966754 AW874250 AW089248 AA384098 BE222810 BE350484 AI598283 AI751863 AI017236 AI886478 AW069250 W68075 AI720991 AI015943 AI754467 AI783824 AI571040 D56926 AI961551 D57123 AW028912 AI581082 AI282168 AW342006 F03390 AI423346 AW073389 AI014855 AW024024 AI222770 AA668236 AA428544 AA604221 AW191942 AI969400 AI079642 AA972764 AI143319 W15228 AI970742 AA031278 AW192098 AA318759 AW341999 AA718987 D57111 AW193306 AA598827 AI632396 AI860086 D56506 AI754168 AI682578 AW628379 AI753721 AA564187 D58203 D57443 D57435 D57135 D57411 N34461 AI754630 AW193407 R45190 AW028006 AI313439 AW193071 D53342 T80798 AA968520 AA954159 AA931107 AI539001 D57804 AI491816 D58192 N70195 AI753783 N57952 D57854 AI309918 T93955 AA327690 AA334434 N74205 N82463 N84571 AI304450 N55278 AA496915 N65969 AA056033 AW148825 R77375 AA338658 W94304 AA719311 N26763 AI358580 AI376810 AI278832 W02137 H80122 AI750472 D57929 H94334 D56712 H11506 AI368225 D56651 D56812 N67498 H83245 H03281 AW518735 AL048586 D58033 AI924572 H70601 D56857 D58301 D57914 D58289 D56882 D56564 AA505619 D56932 D57874 AW193948 D57950 AI247213 F02678 AW264711 AW002353 AI888915 D57194 D56604 D56940 D57465 D57971 AA852884 AW964074 R22175 R71187 R87182 R52933 H63525 AA346326 D57252 D57276 D57045 AI750455 AA853331 AI752372 N70924 R44777 AA977380 D56981 R92439 R83282 AI281593 AA299180 R18692 AW022381 H39815 Z18795 AW519084 F04893 AI583937 AI680378 AI709116 N74220 AI571697 AI446098 AI209065 AA599264 AI889395 AI953531 AI624798 AI570991 T29265 AW960203 F13791 AA599365 H64138 AA853492
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102012	21793_1	BE259035 AU077338 U03057 NM_003088 AW732635 AL134784 AL120159 BE409858 T09062 BE297271 BE294908 BE273148 BE259718 BE261678 BE260498 BE408153 BE259762 BE261974 BE260884 U09873 AW410121 BE019189 BE278692 BE252072 BE383265 BE263157 BE262507 AA774906 BE296630 AW379502 BE538093 AA040533 BE297056 BE293964 BE297011 AA428510 T27582 BE262958 BE382541 AA077541 R87539 AW905865 AW905869 T49230 BE272643 BE256870 BE279828 AI940330 AI940368 BE019144 BE298451 W47256 BE272651 BE018948 BE256797 BE393014 AA852153 BE312227 BE262096 W07585 AA043912 AA403111 AL134704 AA459745 AA027019 M78875 BE265292 AW168964 AA451618 AA186594 AI187107 AI885355 AI339462 AI090054 AA040756 AI937569 AW055162 AI336276 BE205855 AI857647 W30953 AI375605 W95365 BE207928 W32489 AI857443 AA040292 AI093103 AI924761 AA437003 AI564843 AI369291 BE300843 AI566221 AI500381 BE312463 AI453117 AI885669 W78133 AA677779 AI141855 BE208344 AI627739 AA450215 AI150235 BE206671 AI475936 AI493672 AI031615 AW467734 AA908886 AW297260 AW300302 AW515364 BE207810 AA461327 W68528 AI401541 AW298376 AI223266 AA157956 AA728777 AW268529 W81199 W70220 AI359697 AW360928 AI362260 AI961854 AI453087 AI922508 AI749454 AW771707 AW452557 W70219 R62745 AA041210 W68814 AA627393 AI218944 AI887035 AI088922 AI560788 T48210 AA564373 AI208904 AI950808 AW467727 AI081938 AI743346 AI016931 AA502297 AI924504 AI568845 AI671213 AA554629 AI650618 AW015272 AI283991 AI568493 AI968376 AW594745 AI341863 AW196605 AI656603 AW006227 AI087087 AW439650 AI085505 AI656126 AI001102 AW410122 AA927034 AI814950 AW470573 AI568575 AW073874 AW196325 AA665476 AI654701 AI364353 AI458249 AW150618 AI864978 AW103699 AI500694 T06432 AW304384 AW025677 AI682728 AI928669 AW072118 W95376 AA931596 T49231 W47384 M62123 AI880115 AI695915 BE551908 AA599588 AA587443 AA627613 AI825423 AI434053 AI961070 AI341081 BE019156 AI928667 AA923443 AI950232 AI633812 AI990944 AW337670 AI933222 AI985976 AA903555 AI719748 AI621100 W02798 W02155 AA078409 AA922965 AI146961 AA838643 AW044594 BE241997 BE258694 BE311788 BE259835 BE313211
132116	96515_1	AW960474 AA328243 AA704789 AI088169 N20591 AI823476 H81760 AA406184 W44795 AI040999 AA035348 AA632324 BE295273 AA815436 AA406294 AW394165 AA094618 BE296595 AI659092 AW297091 AA401881 AI435984 R80433 AI948677 W05276 AA234767 H87282 AA253183
102034	598_1	AI903474 AI903475 X72913 AL036029 AI903264 AI903383 AI903473 AI903426 AI903263 AI903331 AI903348 AA348154 AA558044 X75546 NM_002023 AA018495 AA568437 AA336463 AA336865 U05291 AA338073 AA360007 H26478 AA151040 R54231 H06222 AA411610 BE184970 R08802 H14537 BE184886 BE184857 BE184972 BE184861 BE184884 BE184890 AA283616 AA486471 H14444 H45124 H42970 H28253 H25914 AA009480 BE184935 AA305772 BE184889 BE184894 BE184931 H28266 T27990 BE184880 AW950249 BE184965 BE395547 W65326 T49139 AA194473 AA194461 AA129907 AI680740 AW513000 AI346045 AA581716 AI674688 AI923173 AA587387 AA411190 AW474604 H06223 AW339985 AA908830 AI143335 AI806156 AW073728 AI570719 AI806149 AI653183 AI138299 AI807167 AI826341 H42900 AI925436 AW190948 AA150949 AI342245 AI991294 AI961468 AI360927 AI264267 AI015857 AI493989 AA527366 AI127268 AI304378 AI911417 AA682520 AI340130 AI346002 AI446304 AA916776 AA621369 AA129908 AI693879 AW836294 H26317 AA469443 H28206 AI609744 AI347112 BE218476 H45427 AA971098 H24697 AA861539 AA947902 AI339991 AI015777 AI828473 AI298202 W51828 AI298200 AW148725 H28218 AI440179 AA018496 AI249821 AI801917 AA663157 AW513059 AI827878 W61309 W48716 AA485748 T49140 AI168001 R08803 AI061052 AI804537 R51837 AI127238 AA284975 AA722722 AI520874 AA993797 AI039374 AA776215 AI084307 AW276143 H44534 AI214418 AW002315 AI422575 AI393603 AW449955 AA029408 AI582937 AI457747 AA194376 AI217628 AI432125 AI474369 AA911062 AI022596 AW276107 AI708968 AA628771 AW263915 AW150018 AA723100 H22132 AW051115 AI424515 AA526379 AI581791 AI933696 AI916839 AW003461 BE502206 AW593940 N67534 AI473431 AA501983
102076	28044_1	BE299197 Z85996 AW247234 AW249122 U09579 AW245698 AW250360 AW250483 BE241887 BE244900 AW247093 AW247357 AA380910 BE208575 AW583068 BE018355 AI751660 AA853842 BE206983 BE207145 L26165 L25610 U03106 S67388 BE257775 AA456445 W01311 BE263645 BE279085 AW732606 BE263622 BE265001 BE297240 BE263520 BE279288 BE256088 BE255900 BE252329 AW239199 L47232 L47233 BE207178 T08389 BE252557 H24262 BE258576 BE251231 AA381909 AW836368 BE206752 AA029109 AW820448 AW820447 AW843746 AA376396 AA321901 AA310434 AW249019 R46847 AW843743 AA375906 D31116 AA376199 AA065009 AW842884 AW842793 AI752795 W02824 H83378 M79002 R74301 BE545783 BE266009 R87600 BE180828 AA375519 AA376322 T53381 W39472 W44813 AA902104 R79427 AW246239 N44912 AA376207 R27374 BE253553 BE207052 AA376096 AW674390 AA187864 AA382005 N42395 N43766 AA373406 AW167163 AA320920 AA187865 BE245429 AA725216 T73450 AW248657 AW248580 AA614342 AW248690 AA134592 N95402 C06087 AW890404 AW890491 W74355 AW890497 AA481474 BE183394 AA854012 AA574254 AA845586 AW795988 AA029195 AA618214 W24029 N23941 AI753303 N35012 AI094940 W76550 N35823 R27375 AI123889 N33064 AI590965 AI146429 AI818625 N33420 D25587 AA716735 N34995 N35249 C21315 AW996039 AA302439 AA134593 AI494143 BE504194 AI191867 AI018663 AA554359 AI041908 AI369918 AA320526 AI041930 AA631887 AA629728 AI752794 AA857879 AI090388 AI751659 AA932518 AA705773 R46753 W45365 AW192512 AA603001 AA069286 AI355869 AI986250 AI813372 W45293 BE301229 AW511449 AW338097 AW247845 AA454553 AW246700 AA621693 AW780118 BE301970 AW129949 AW001364 AW732086 R79428 AI640886 AI814746 AI671072 AW338463 AI457583 AI955722 AW250453 BE046057 BE301255 AI623838 AI066427 AA069702 AI754612 AI274183 AI818343 AA838666 AI087209 AI859858 AI590130 W46516 AI565171 AI862747 AI453163 AI815083 AI628269 AI073360 AI572101 C05955 BE501618 AI677993 AI354988 AW337646 AI623382 AI890317 AI678661 AI979004 AI634583 AI867024 AI961540 AI973138 AI215141 AI866715 AA962447 AW073998 AI365137 AW798270 AI813378 H22870 AI500446 W46448 AW591391 AA083831 T29792 AI952615 AI086902 T53382 R87514 AI147453 AA972341 AW839649 AI971521 BE257943 AI921309 AI079598 AI808947 AI872642 AI270535 AI826937 AI460140 AW615599 AA725669 AW250749 AA324110 AA310402 AA070728 W80687 AI283834 AW674560 AW572555 AI590414 AA534813 AW615591 AI274741 AA576395 AI148273 AI473483 AA644199 AA069979 AW250955 F32303 AA903331 AI866694 AW513154 AI688374 AI688433 AI270034 AA592895 W45388 AA853841 AI561234 AI572977 AI479694 AI760933 AI197843 AA911744 AI468987 AW615457 AI359185 AA977002 AW247999 AA503804 N73486 AA894383 AW020369 BE287310 AA374760 W80866 AA112103 BE267320 AA522678 N42177 W24033 N35290 BE241689 BE265689 AW952075 R32687 AW246894 W40328 T25822 AA029873 BE266934
132160	128565_1	W26406 AW136872 BE349103 AA935418 R54810 AI804000 AA879147 AI912294 AI339626 N40443 AA807907 AA446520 AA418512 AA101321 AA281770 AA227954 AI435989 AW975199 AA253044 R42784 R44804 AA227789 AA253099 AA280126 AI383274
131507	89088_2	AI826268 AW248872 H69511 AI748806 AW779557 AI992254 AI890377 AW151271 AI356374 AI634503 AA777065 AI590131 H37767 AI889058 H69512 AA046480 N27343 AI573008 AW130925 AI635838 AW594603 AW000790 AI208239 AI275835 AW090294 AA021587 AW273456 AA505726 AW469424 AI400222 AI025723 BE046148 AI128668 BE350462 AW302601 AI299977 AA284809 AI640358 AW470364 AI241794 AA650048 AW090027 H15377 AW615318 D60021 AI934336 AW118536 AI041281 AA614238 R85918 AW571741 AW516692 AW572232 AW515188 AI798585 AI392825 Z40518 AI869580 AA469975 AI537819 AI810684 AI701744 AI370410 BE383083 Z44676 BE002481 BE002532 AA456765 N44196 D60022 C14604 AA021099 AA284872 BE266647 AW249292
132164	10250_1	AI752235 NM_000935 U84573 AA376884 AI752236 H99903 AW958071 AA306948 AA164966 AA091705 AW800587 AW800586 BE179465 AW859424 W00413 H97211 BE177724 AI934537 BE177812 AA047529 AA047470 BE177792 H61340 AI700185 AI754404 AA502791 AW104174 N72144 AI499102 AA600050 AA468755 AI302561 AI300888 AA047409 AW873407 AA047431 H97212 N29559 C75482 AI095284 AW630441 AA115019 C75681 AI754224 AA164967 AI439457 H89682 AA983296 AW662585 AA853277 AA333773 AI754603 W30982 AA853377 BE169188 BE169223 AA115490 AW385682 AA993543 C02404 BE169185 BE169226 AW023640 R64182 AW993827 AI376301 AA043545 H62370 AW069486 D16887 AA343887 AA343832 AW956555 BE175910 N47487 R69794 AW592387 T40161 AA884315 N98463 AI051407 AI678677 AI927978 AW664579 AI590727 AI090077 AI061451 AI147531 AI620584 AA617746 H99816 N47488 AI823867 AA605292 N64131 AI948780 AI767933 AI559698 AI564677 AI269461 AI420317 AI831711 AI146359 AW168879 AI689354 AI346276 AI818252 AW627427 AI564693 AI921964 AI371427 AA853695 AW448942 AI361529 AA136707 AI309578
131514	3341_6	BE270734 N84664 AW391922 BE562375 AV656944 AU076480 AV657989 AA263039 AI689817 AL035898 BE439785 AW248984 BE439680 NM_005566 BE440087 X02152 BE247355 AA295004 AA352895 N85654 W39536 AA127165 AV661179 AW068778 U46319 AW408320 AW068761 AL046907 N86790 AA324068 AA100170 AA313489 AA337052 AA381153 T18854 AW672854 AA366281 AA356618 BE219350

		BE122814 AW630254 AW403442 R29627 AA375795 AW401663 AA683275 AA356222 BE410618 AA303830 AW498613 AW402378 BE258279 BE440060 BE539170 BE547722 BE620522 AW239013 BE618205 BE622304 AA381037 BE537289 BE538975 AW238805 BE546710 AA330972 AA376336 BE513559 BE295994 BE544569 BE543720 AA317908 N88057 BE545225 BE293935 AA360992 BE408886 AA206192 BE206839 BE398082 N84521 BE547881 AW651808 BE315212 BE545550 BE277333 BE274843 AW239248 AA176376 BE542891 AA348058 BE544201 BE548621 BE304755 BE269329 BE548052 BE269921 AL048472 BE560089 BE315560 BE613006 AW401848 BE293081 AA223405 AA356051 AA315114 BE267163 AW610536 BE409389 BE513915 BE270766 BE561005 BE560641 BE548838 BE546443 AA383753 M78064 AA376402 AW958176 AI133342 BE614058 X03077 AA885733 BE548461 AW663131 AA853435 AA324697 AW405517 AW374649 BE019816 AW403098 BE539709 AW673496 AA373182 AA376953 AA090902 AW818624 AW393154 AW363737 AA143265 AA522902 AA375189 AW631262 N85647 BE256998 AL047055 AA489611 AA325311 AA374272 AA191652 AW068352 AA192283 BE265168 AW875505 AW401551 H64734 BE082132 N28721 BE270502 BE542010 AA095724 AA343838 AW862085 BE018237 N87961 AW402423 AW751453 AV648593 AA181533 W22134 AI814282 W27728 AA093676 BE620919 AA190693 BE618676 AW381000 AI675188 AA641654 AV648830 AV649121 W28254 AA133363 BE270651 BE314938 AA305540 W45064 BE613301 BE612706 AA774700 AW384452 AI129236 AA057759 AI904807 W26745 AW084436 AA092287 AA001711 AA148070 AA178879 BE614378 AA179254 AW673499 AW579754 W28174 AA083731 AA329644 AA491628 AA112012 AW673497 R57285 AW890681 BE614541 BE613168 BE184013 AI564430 T20087 AA357545 AA370341 AW020002 BE145977 AW386319 AI133645 AA928522 AA320082 AI564564 BE146370 BE535886 AI689539 AW364263 AW024767 BE181237 AI567727 AW386202 AI571579 AW007432 AW384430 AW751655 AW062554 AW190747 W25883 AW935205 BE439825 AI814738 AI609535 AA091211 AA847334 W25852 AI676217 AI917915 AA133283 AW385898 AW363381 AA676500 AI609403 AI922710 AW364148 AI819125 AI813788 BE439591 AW440632 AI669641 AW607753 AI961251 AW170466 AI813789 AW152388 AA733181 AW881158 AI829362 AI954017 AW089722 AI922140 BE613363 AW168114 AW471245 AI244988 BE612632 BE270925 W23836 AW753365 AI560061 AW607746 AA577685 AA856957 AL035899 N95408 BE546918 AW248541 AI889518 W24244 BE439756 AI493263 AA522799 T12329 AA211606 AW994980 BE140459 AA088784 AW948548 AW473607 AA191367 AW518727 AW882031 AW995169 AW995230 BE350742 AW265117 AW068516 AI590933 AW675814 W44616 AW675815 AW069302 AA088433 AA563768 AW805583 N30472 AW770831 AA055432 AI185055 AA121701 AW361826 N69778 AA192372 H05914 AI719090 R93535 AA129531 AW675529 AA595638 AI922588 AI422336 AI272104 AW151094 AW770435 AA618622 AA258849 AW069346 W94137 AA120950 AW117291 W45032 AI660716 AI075409 W94042 W95255 AW368447 T92573 AI753582 W61154 AA351993 T92645 AW151115 AA022712 W61202 BE547553 R93536 AA988264 AA384897 AI094678 AA022677 AA092958 AA356987 BE301717 W44597 BE539272 AI298981 W28476 AA857019 AA176406 AA126956 AW305382 AI376216 AI697013 AA176377 AA047415 AI368827 AI149318 T29905 AA223193 AW516507 AI952675 AA179002 AI523190 AI783877 AW473510 AW591026 AI689234 AI344434 AI299568 W45074 AW591339 BE042704 AI625502 AI523214 AI130808 AI719319 AA577323 AW473063 AW078789 AW068499 AA143226 AA527432 AW275892 AA100109 AA508682 AA586859 W95157 AI300997 AA534023 AI128750 AW386900 AA614319 AA962754 AA856565 AI000278 AA653314 AA779547 AA206056 AW750900 D52315 AW474584 N28845 AW278888 AA838489 AI282260 BE139186 AI619548 AW779619 AI476382 AI037996 AW263016 AI250703 N23056 AI285729 AW578650 AI289903 AA969812 AA486870 AA320509 AI560614 AI864164 AA353053 AW243842 AI358342 AI797438 AI752952 N94562 AI752940 AI700314 AA057760 AI535686 AI535709 AI535748 AA599435 AA676481 AA528726 AW272953 AA482791 AI077656 AW939918 AA577529 AA506613 H65225 AI700337 AA381152 AI719010 BE073480 BE073615 AW673514 AI289146 AW938944 AW939006 AW938996 AA586484 AW602284 AW938978 AW938935 BE073538 BE162787 BE073576 BE073462 AI459815 AA953334 AA716636 AI950483 AW779608 AW938951 AI889673 BE073553 BE162774 BE185856 AW602273 BE073474 BE073483 BE073618 AW602281 BE073542 BE073475 AW939008 BE073558 AW840704 BE073489 BE073463 BE162767 BE073562 BE073470 BE073496 AW602274 AW939015 BE073512 AW602307 AW602314 AW602294 BE073568 BE073557 AA497029 BE073548 BE073511 BE073573 BE073536 AW939039 AW939026 BE073513 BE073466 BE073484 BE073493 AW603154 BE073625 BE073464 AA826629 AI721117 AA350594 T18953 BE007495 AW386898 AW793511 BE049519 AA565171 AW615051 AI347369 F01518 AI453289 AW071021 AW903128 AI718581 AI865531 AI753430 AW195177 AI753768 AI073727 AA599422 AW581743 AA667963 F01838 AW873884 AW613604 AW118005 AI521539 AW189876 AA853434 AW078573 AW027822 AI949090 AI753184 AI350844 BE162788 AW579284 F21714 BE156356 AI933613 AA953358 BE162875 BE070057 AI890891 AI688843 AW410101 AW276840 AA587013 BE070108 F29773 AI282914 BE070061 AW386904 AW386916 AW194231 AI446479 AA953634 BE161417 AW581762 AW581777 AW581774 BE161422 AW050520 BE543373 AI355481 AW386910 BE547892 BE544480 AW079762 AA528582 AA665889 AA148030 AI253726 AI253505 AW366859 AW873892 AA135307 AA648595 AW386833
131517	33543_2	AB037789 AI384100 BE385519 BE260428 BE384511 BE275843 BE408781 BE277845 W21965 W16748 BE265242 BE265000 N25829 N31401 AA625166 AA369179 AW957071 AA909230 W92748 N22686 W92871 R11325 R72437 N40002 N24106 AA693637 R11326 R50995 N77818 AI039300 R97894 R43655 T88940 F10026 D56301 N20947 F10378 AI870678 AL120199 N27270 AI699902 AW182302 BE500982 AI422172 T33581 AI982515 Z40886 AI202949 AW572248 AA461382 AI337215 AA461202 AI695957 H23850 BE297221 AL120198 N27816 N46020 R96766 AI907845 BE142664
131524	36097_1	AB040927 AW503387 AA044786 AI686957 AW157364 AW976667 AI752687 AA191323 AA568170 AI161414 R17699 AI140787 AI140789 AI140788 AA742642 AA044809 AA485805 AA847859 AA480178 Z45709 AW974554 BE043079 AA809758 AA648838 N46563 AA485676 AW304745 AV657192 AI553650 AW118847 AI871278 BE075093 AI243817 BE046860 AI560949 AI669278 AA860508 N39152 AW131465 AA787854 AI457964 AA906227 AA719822 Z41372 T93491 AA954262 BE537985 T96329
101461	14616_1	N98569 AA029143 W15554 NM_000300 M22430 T39452 T47319 AA371017 N57336 D58694 AA320723 AA296089 R50467 AI346657 BE071861 AA319881 AW843848 AA320114 AW820896 AW610375 AW393463 AW179006 AW610166 M22431 T46945 R70570 H02725 AW055209 R83131 AW392662 R80611 R53758 AA885780 AI749547 AW391366 AI970800 AW610360 AW821761 AI830923 AW000798 AA320004 AI249110 AI720962 AA682561 AA586608 AA643641 H00742 AA582755 AA609109 AA370548 R53759 AI672244 AI832430 AA683552 AA838623 R64075 AA936945 AI445267 AA534281 AI149280 AI274363 AI698468 AI128751 AA707159 AI150776 AA131825 AI991026 AI248667 R77118 AI168206 R50468 AW051904 N80785 R77117 AA037587 R63969 N32242 AW470160 R80612 R22811 AA320457 AI734854 AA534110 AA770261 N69947 R63087 H02619 AW768748 AA507524 T53621 AA535170 AI201371 BE439722 T61271 AA554850 N69967 AI805226 AA320357 H00653 AA229266 AA029021 R25199 AI659785 AI784636 AI186301 AI916742 AI581906 AI924395 AI569357 AI582097 AA534166 AA533431 AA758464 AA642546 AA593596 R70480 AA327298 R21194 R24705 N98328 AA131992 AW150658 AA533307 T29484 AI198476 AI581608
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101473	17314_8	M22976 AA345036 AW965168 AA400330
100829	35156_1	AA471098 AA172156 BE206918 AA312757 AA333112 S70154 NM_005891 BE616558 AW249190 AW245878 AW249313 AW248125 AW247768 BE394856 F06359 R25823 AA232077 BE539645 BE208572 BE208578 BE266662 BE266445 BE280650 BE259594 AW733042

		AW328148 AA309505 AA353144 AA341050 T60904 T28076 T47718 AA129946 AA262195 AI193574 T93111 H55877 N91324 AA002113 BE274441 BE568128
101486	2464_1	AA506324 AA244003 NM_001099 M97589 X53605 T29524 M24902 X52174 M34840 U07097 AA244034 AA370422 AA371462 AI557152 AA371312 AA559165 AA370116 AA370907 AA370806 AA559352 AA642055 AA508355 AA492280 AA659719 AA527805 AA533057 AA369877 AA224876 AA228288 AI611683 AI417485 AA370186 AA602957 AA564484 AA527737 AA502979 AA507777 AA687674 AI821627 AA420721 AA568138 AA226366 AA613900 AA225411 AI547266 AA550913 AA573645 AA603487 AA603374 AA579543 AA603504 AA531198 AA504027 AA654378 AA524778 AA654286 AA532701 AA304845 AA654793 AA541709 AA536037 AA492388 AA658213 AA613916 AA532485 AA507735 AA658552 AA661553 AI826518 AA503930 AA659546 AW974889 AA653856 AA635363 AA492232 AA595853 AI097515 AI810547 AW970997 AA533398 AA579285 AA614165 AA574271 AA224879 AA602106 AI680583 AA513560 AA635456 AA641194 AA574278 AI359820 AA216360 AA507606 AA533172 AA640672 AA525029 AA225232 AA531057 AA507770 AA524780 AA640508 AA226453 AA228672 AA503139 AA650355 AA622824 AW137215 AA480545 AA569791 AA573630 AA507710 AA661901 AA640749 AA665287 AA569735 AA225383 AA603907 AA225146 AA225386 AA640832 AI928272 AA639911 AI826687 AA640364 AA514799 AA531382 AA657931 AI670092 AA614077 AA225527 AA654031 AA643799 AA978215 AA603863 AA548498 W57824 AA468243 AA603506 AA225469 AA657510 AA469463 AA507690 AA468274 AA572717 AA492165 AA630918 AA602090 AA224845 AA809521 AA579441 AA468201 AA513568 AA230147 AA650340 AA468315 AI621137 AA467755 AA492279 AA467793 AI732062 AA493280 AI685444 AA226678 AA565429 AA574197 AA658851 AA225793 AA533879 AA226541 AA531364 AA226206 AA658390 AA229980 AA527610 AA226698 AI401663 AA502080 AA508392 AA564283 AA468972 AA225786 AA635299 AA229727 AA226365 AA507972 AA507213 AA559173 AA526555 AI810857 AI826536 AI926993 AI971003 AI597835 AA532598 AA225414 AA502179 AA653047 AA658361 AA467937 AA527905 AA228275 AA225135 AA230012 AA507232 AA573601 AA579479 AA492263 AA468504 AA494247 AA652678 AA492335 AA658231 AA569773 AA508004 AA658008 AA613784 W57562 AA469306 AI685773 AA531127
100830	4002_1	AC004770 W05005 AA356068 AA094281 H29358 T56781 AW875313 L37374 BE312466 BE311755 BE207106 BE293320 BE018115 AW239090 BE548830 AW247547 AA776062 BE397382 AA486713 T10111 T09340 AW498981 BE547280 AA356003 AW581520 AW875331 AA580720 AW875336 BE276873 BE408229 AW188148 BE255166 BE253761 AW793727 AW373141 AW581548 AA471223 AA305950 BE263976 AA626820 BE257409 AW360962 AA090655 C00312 BE312741 BE407213 AA209352 AW298199 AW248553 AW297794 AW731722 BE300586 AW731972 AW615446 BE301599 AW615520 AA486714 AW440257 AA196516 AA564630 AA618079 AW192592 AW474985 AA604580 AI627461 AA765440 AI680394 AL135548 AI683224 AI581126 AW245096 AW194154 H29274 N70363 AA629758 AA580602 AA862006 AI863841 AI097667 AI928583 AI358774 BE243487 AA620553 AA653297 AA292690 T10110 Z38906 AA908544 AA340930 AI185438 T03328 T28844 AI687010 AI864965 AI872575 BE388740 T56780 AW373138 BE258717 AA699871
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118578	13667_1	D21262 AA191530 AA190834 M85417 AW379190 AA332366 AA315951 AI355279 AA361073 AA039243 AA354828 AA158293 AA037752 AI913175 AI886058 AW149765 AA285228 BE259115 AW581581 AW799319 AA854695 BE167356 AA306910 AA380711 AA065300 AA065299 AL042662 AW001637 AI540378 AI834341 AW845164 AW845148 N41585 AW800478 AI834348 BE018761 AW606705 AA984206 AA037820 AI823555 BE621602 AA317943 AI867463 AI834314 AW169072 AA301112 AI393269 AI765681 AA085577 BE206473 BE504372 AA037821 AW904317 AW816615 AA191216 AI419971 AW896673 AI347506 AW474810 H73662 AI719116 AA112312 AA804343 F08714 AI739077 AW293811 AA243182 AA307171 N30810 AW951659 H07013 AI871859 AW137084 R14083 AW604603 F08531 H17699 BE467896 H53670 AA721269 AI347405 AA716645 AI471940 AA586782 AW805850 AA312144 W20312 R10258 AA830285 BE069171 AW820001 AW819991 AW819996 AW820000 AW749364 AA488526 T97118 AA370129 AA128268 AW404500 AW404495 AA251278 R09997 R07421 AA135889 H30073 AI290885 AA465246 H87665 H58579 AA237043 AW582709 W75966 H20420 D19586 W95624 BE813121 W79195 AW051506 AI096635 BE502347 W01058 BE090549 AA740769 Z24773 H22678 H44226 H46705 W74378 AA740861 AA807204 AA126700 H53630 W93517 AW025405 AW237649 AW271261 AI669834 BE463909 T64902 AI949804 AI681513 AI656494 BE502392 AI262290 H30074 AA188798 H46706 AI423181 AA488393 AA196450 BE467847 AI650852 AI768392 AW302213 BE047333 AI936134 H46726 AI887878 AI865821 AI969789 AW576386 AW206228 AI950503 H20421 H73355 AA827834 H05462 H46184 AI690176 AW024743 N70206 AA098927 AA079325 AI279466 AW302583 AW614861 AW002582 BE302327 W60927 BE048732 AA995149 AI144395 BE326903 AA854192 AI130791 AI341272 AA354666 AA767715 AA569154 AW139816 AI123439 AA526024 AA135890 AA593870 AA581556 AI623728 W95625 AA828018 W60796 AA910657 AA829472 H46032 AI091166 AI161324 AI636814 AI825415 AI522055 AI439510 AI093498 R16744 AW675537 H17083 N90709 H62578 AA661505 W70262 D29057 AI077619 AI418692 AI142728 AA659087 AA826189 AA465139 AI122598 T29720 AA732157 AA829358 Z24774 AA516265 AW044679 AA983639 AI708668 F04740 AW248000 AI744014 AI864236 AI927536 AI537721 D51272 F04643 AA854371 AA365196 AI864161 AI632868 AI284585 AI219419 AI693767 T16740 AI219627 T17450 AI204120 AW503744 AA196693 AL040034 AA113068 AW503365 AA356890 AA243243 AA219341 AA773923 R01675 AA034227 H46105 H46183 H46799 H46694 H62511 T97003 AI564807 AW606635 AW606750 AW606755 AW606640 BE301924 BE294562 AI124093 AA206535
108731	20618_1	AA258888 AA320012 AW976088 AW971357 AW175623 AW175760 AW175769 AW578267 AW162589 N27262 AW160986 AI138629 AA035553 W94453 W94335 AA326606 AF070655 AA040163 AW939331 AA307814 F26425 AW992386 N90194 AA040625 AA150547 W69159 BE138584 AA341766 AI148038 BE566222 W38579 N77160 AI298471 AI343730 AA345321 W39695 W69285 AA010132 W92598 AA046361 W05009 AA318988 F25225 AA150856 N70368 AA044697 AA046123 N80350 AA035042 AA385776 AA188329 H75363 AW966638 AW577569 W79260 F25637 AW406233 H23856 D52811 AA352610 AI143578 BE379846 AW793049 AI343875 AW610545 AA359285 W94758 W47488 H12428 AA358855 AI369400 BE395297 AA525068 AA302040 AI242419 AA149321 AA424437 AA524660 BE253984 AI905952 AA007429 N39993 F31088 BE394339 W45050 AA149322 AA513324 AA314633 AA824412 W51797 AA341568 AA010131 AA694376 AW102890 F34059 W19392 AA812656 AI869736 F27755 AA576131 AI143774 AA716385 AA703096 AA919120 F25391 AA230068 AI356218 AW071769 AA278832 F35953 AI888651 AI493729 AI708640 AI193656 AA687825 AI199196 AI749445 AA699849 AA716240 AW167928 AA862560 AA748006 AI707874 AA644456 AA514577 AA229712 AA702859 AI079192 AI735121 AA860999 AI298063 W73957 AI249062 AA877339 AI344393 AW081418 AI125659 AI253692 AI342137 AA938586 AA996273 AI354251 AI027525 AI000888 AI571807 R98880 AA046297 F30432 AI431253 AA989596 F32819 AA890187 AA723172 BE222820 AW026363 AI358909 AI368760 AI373198 AA424340 AI096897 AA044635 AA992388 F24564 W47548 AA134704 AI001866 AI078849 AW136163 F33003 AW243990 F29682 AA863194 W76357 AI096896 AI833043 AW401684 AA877917 H68905 AI242903 AA936162 AI879810 AA641218 F33251 F21727 AI749228 AA565968 AW328278 T39147 AA723149 AI709266 AI215053 AA953153 AW328279 F36005 F20893 AI126684 AI129650 AI266132 AA369791 BE292945 AA865249 AW204654 AI126335 AA961439 AI144014 AI266463 AA722464 AA007430 AI339922 AI302037 AA126313 AI582281 H68804 AA278267 AI253670 AA046032 AI707513 F20312 AW263859 AA029374 AA742842 W72388 F20313 AI707661 AI581659 AI582684 AA626130 AA648242 AA648339 AA648336 AA725774 AI718756 AA534435 AW841857 F34887 F32906 AA353786 AI719543 AI886600 AI648456 AW887101 BE172996 F24926

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108732	20618_1	AA258888 AA320012 AW976088 AW971357 AW175623 AW175760 AW175769 AW578267 AW162589 N27262 AW160986 AI138629 AA035553 W94453 W94335 AA326606 AF070655 AA040163 AW939331 AA307814 F26425 AW992386 N90194 AA040625 AA150547 W69159 BE138584 AA341766 AI148038 BE566222 W38579 N77160 AI298471 AI343730 AA345321 W39695 W69285 AA010132 W92598 AA046361 W05009 AA318988 F25225 AA150856 N70368 AA044697 AA046123 N80350 AA035042 AA385776 AA188329 H75363 AW966638 AW577569 W79260 F25637 AW406233 H23856 D52811 AA352610 AI143578 BE379846 AW793049 AI343875 AW610545 AA359285 W94758 W47488 H12428 AA358855 AI369400 BE395297 AA525068 AA302040 AI242419 AA149321 AA424437 AA524660 BE253984 AI905952 AA007429 N39993 F31088 BE394339 W45050 AA149322 AA513324 AA314633 AA824412 W51797 AA341568 AA010131 AA694376 AW102890 F34059 W19392 AA812656 AI869736 F27755 AA576131 AI143774 AA716385 AA703096 AA919120 F25391 AA230068 AI356218 AW071769 AA278832 F35953 AI888651 AI493729 AI708640 AI193656 AA687825 AI199196 AI749445 AA699849 AA716240 AW167928 AA862560 AA748006 AI707874 AA644456 AA514577 AA229712 AA702859 AI079192 AI735121 AA860999 AI298063 W73957 AI249062 AA877339 AI344393 AW081418 AI125659 AI253692 AI342137 AA938586 AA996273 AI354251 AI027525 AI000888 AI571807 R98880 AA046297 F30432 AI431253 AA989596 F32819 AA890187 AA723172 BE222820 AW026363 AI358909 AI368760 AI373198 AA424340 AI096897 AA044635 AA992388 F24564 W47548 AA134704 AI001866 AI078849 AW136163 F33003 AW243990 F29682 AA863194 W76357 AI096896 AI833043 AW401684 AA877917 H68905 AI242903 AA936162 AI879810 AA641218 F33251 F21727 AI749228 AA565968 AW328278 T39147 AA723149 AI709266 AI215053 AA953153 AW328279 F36005 F20893 AI126684 AI129650 AI266132 AA369791 BE292945 AA865249 AW204654 AI126335 AA961439 AI144014 AI266463 AA722464 AA007430 AI339922 AI302037 AA126313 AI582281 H68804 AA278267 AI253670 AA046032 AI707513 F20312 AW263859 AA029374 AA742842 W72388 F20313 AI707661 AI581659 AI582684 AA626130 AA648242 AA648339 AA648336 AA725774 AI718756 AA534435 AW841857 F34887 F32906 AA353786 AI719543 AI886600 AI648456 AW887101 BE172996 F24926 N62575 AA283350 NM_006476 AF092124 BE086662 F18594 AW816300 N84990 N85147 AA558336 AA303561 AA380197 AA369267 H42116 R53377 T68016 AA354932 AA036980 F33850 AW374019 AI263680 AA029373 Z21418 Z21417 BE567973
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101505	14092_1	AA307680 AA308686 BE252938 BE162177 AA252561 AW577933 AW750513 AA326527 BE281625 R15975 BE567378 AA315193 R14052 AW875781 AA180011 AW875831 AL134981 AA446427 AA652124 AA662020 AA649534 AA649822 AA652118 AA307419 AW377280 AW377293 AA773574 AW377338 AA362376 AA195483 AI870173 AI090858 W05296 AW383640 AA024647 AA599163 AA630601 AA205487 AA164747 AA164748 AA181056 AI828823 AW574914 AA599212 AI499069 AA581816 AI435156 AI568188 AW673033 AI004571 AI263712 AA894927 BE087002 AA948141 AA446119 AA812415 AA514946 AA456625 AA205318 AA442877 AA435521 AA426166 AI911813 AA243054 BE208046 AA830424 AI090292 AI240388 AA626750 AA424926 AA768432 AI935046 AI433060 AA158206 AI342258 AA989506 AI082283 AI865398 AA024693 AI445024 AA527990 AI363735 BE328333 N75485 AA626448 AA947203 AI028221 AI934643 AW392206 AW392054 AI042562 AI341665 AA159366 AA134971 AI270387 AA315014 AA223574 AA157555 AI085919 T28878 AW518353 AI672839 AA053461 AA654257 AA921347 AA152329 AA362375 AA219493 AI510831 AW470571 AA350306 R15974 AA608732 AI569355 AI719108 AI630717 AA040890 AI932667 W95113 AA954366 C21408 AI632334 AK000379 L35946 AC005328 AW377352 M15798 BE294141 BE271424 R05864 AW383658 AI025236 AA190772 AA300684 R37150 AW951773 BE270119 NM_001673 M27396 L35946 AW247784 AA315660 AA776680 AA314621 AA053213 AA206750 AA205575 AA333552 AA313490 AA243053 AA207213 AU076641 BE019503 AA307677 BE295104 BE295904 AW392327 AA347324 AA152328 AW675263 AA316929 AA307925 AA186979 AA223615 AA307366 AA382588 AA325720 AA219455 AA308175 AA312108 AA376260 AA307046 AI305172 H55311 BE396595 AW950145 BE257066
131614	9180_1	AB002438 W00433 H12256 R98158 R77102 AA701334 AA701322 R77103 H12257 N72166 R96852
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101568	13504_1	M81740 NM_002539 X16277 AW328091 AW410397 AV661376 X55362 BE280466 AU076625 BE294443 BE275912 BE263069 BE298146 D28365 AA083969 D56186 AW409782 AW411215 AA329920 AA263021 BE545044 AW948849 AA134430 AA344435 BE407381 BE408932 BE275325 BE409376 BE276228 AI630109 AA352473 D16972 BE266384 BE546467 BE265953 AL041032 AW674950 BE535919 W40557 AA100024 M20372 W40555 AA227011 AA069681 BE559766 BE172822 BE513306 AA085082 AA112665 BE312878 W38689 W07253 AA055687 N85193 BE386316 BE385366 BE384800 AA054667 BE174466 AA182548 BE265553 BE536375 AA329653 AA306812 AA358220 AA338825 AA632690 T90242 AA263176 AI940109 AA299212 AI940112 AA384761 AW405415 AA079789 AI800720 AA136478 AI870516 T79067 AA670138 AI554441 AI559974 AI609383 AW374308 AI354984 AW081618 AA378252 AI200963 AI355847 BE619751 AI884700 AI860536 AI690567 AI924507 AW193963 AW190138 AW999868 AW080817 AW173652 AW439627 AI671643 AI815168 AW468211 AW194684 AI523666 AA306634 AW474229 AA626604 AA630695 AA628750 AW411216 AA729034 AW081271 N93223 BE302222 AW273126 AI762486 AA666010 AI590145 AA588505 AW337835 AW674238 AA461467 AI457245 AA583096 AW675526 BE301409 AA973275 AA516446 AI476314 AI186122 AA612645 BE393260 AI128342 AW675583 AI367650 AA887837 AW009877 AW469012 AA629564 D19880 AI582401 AW575382 AW473901 AW474902 AW089774 AA758334 AI150181 AA768796 AW328092 AW304994 AI201801 AA418796 AI160818 AI147630 AA808372 AW008046 W96304 AI364925 AA665857 AW651624 AW410398 AI168015 AA190876 AA226901 AI217443 AW845131 T90687 AA418741 W42773 AI097159 AI084902 AA235099 W42771 AI277727 D53990 D53195 AA134431 AA112666 AA055467 AI049585 AA099209 AI341729 AI492613 AI061312 AI275005 AW263957 AW006655 AA182616 AA079676 AI183509 W96211 AA086389 AI492863 AW439176 AW173464 AI866892 AA088904 AI368922 N78824 AW193163 T78592 AA055555 AA056273 AA083863 AW410391 AA748823 AI472504 AA412729 AA199595 AW078992 AI866784 AA761535 AW089525 BE140308 AI871389 AI591373 AI718948 AI678334 BE140333 AW806704 BE140339 AA308250 AW950168 AW951719 AI926362 AI885977 T16465 AA740422 AA190845 M16650 BE537237 AA361589 AA315239 BE280907 M33764 M31061 M34158 AW402669 AA460115 AA393056 AA099223 BE173285 AW672851 BE619200 BE382867 AW090831 BE018648 AA533486 AA234818 BE514966 T28236 BE265879 AI273645 BE538586 AI214413 BE542051 AA112889 AA947504 AI276424 AI224401 AW088139 BE262559 BE260861 AA622899 N99955 AW088872 AA307760
101597	1021_1	AA317089 AA442916 BE018728 R17428 R19922 AA160553 AA164830 H25179 N27678 AA351858 T81276 BE384178 F07423 H85309 AA323562 AA180532 AA180375 H28912 BE254427 R18376 T39966 N31431 F12315 N42439 R13760 AA322782 T17003 AU077087 AW249111 R20863 BE560331 BE280947 T80253 AF052153 F06191 R22683 W86744 NM_002079 M37400 W19305 F12496 AA013284

		H22855 T74293 AA223443 W00525 R37531 R25024 AF080467 T19744 R58244 AW409579 AA316170 W44675 H80995 AA316031 W87620 H69824 R18966 R60283 N25020 BE541059 AA307315 R70424 BE206512 R52217 AA339023 R10469 R21094 W31877 W49532 AL134314 AA216031 AA376793 F07621 AW206876 AA135283 F06385 N35354 R16629 AI183934 AA903488 AA284445 N99020 AW410742 AI051965 AA525446 AI056291 AA093408 AW055354 BE541793 AA354750 AA852327 AI040660 BE465585 AA576665 AI248233 AW409837 AW248679 N43896 AI038470 AI004439 AI032035 T15765 BE207923 N91602 AA977665 AI524378 AI143696 AI188531 W87691 N25319 AI243901 AI128726 AI040603 AI040576 AI017003 AA976343 AA587603 AA847257 W87835 AA384689 AA877691 R69443 R60789 AA694380 AI057253 AA255671 AA708176 AA203326 AA203175 AA894963 AI934171 AI052604 H28913 AA453394 T39932 AI026794 AI026795 AA602988 AA704689 R10146 N72237 R38887 AA860444 R09569 N26262 R42579 R16570 AA197075 AA502302 W16861 AA677782 AA196998 W87538 AA341005 W44676 F19219 AA194447 R00509 BE159108 W87692 AA954367 R38605 AI336258 R38726 BE179060 AA729458 AA281308 F03654 F02469 R43389 R10371 N35140 AW135113 AW024385 AA857158 F09940 AI553889 AA311889 AI301685 AW051541 AA135146 AI978868 AW410743 AI811331 AA580894 AI857472 AA449100 AI675166 M78228 F36094 AA873314 F31295 AA203470 BE302295 BE328314 AW512864 AI021916 AA916405 AA223949 AI267965 AA807520 AI222735 F03867 N20841 AI094050 AA872351 AI094049 W87756 AA626786 AI365638 AI280192 AI149419 AA890014 W49533 H82126 H82138 H85381 AW978689 R42042 AA825540 AA808185 AA621319 AI276814 AW675475 N33466 AA844406 AI338233 AA804279 AI140172 R08039 AI371372 AW779420 AA973959 AI350202 AI311858 AA844068 AW051465 R58917 AA262562 AA255513 AA179827 R43808 R43783 AA179748 AA160554 T85488 AA223203 N70089 R52121 R43981 AI350079 H24363 AA844320 H80996 H72681 AA281259 AA863323 AA746986 R42662 T85278 AA194361 AI770137 F10117 T89022 F02675 AA194370 AA287013 N69852 T40917 N48265 R36686 H06305 T29294 R46268 H69825 R45142 AA166673 AA910318 R06282 AA203747 AA194455 R08090 R09678 F01096 R00610 R06340 AV651346 AV651308 AA089496 R57012 BE276300 H22856 AW751492 AW751491 T66408
100999	16380_1	H38765 AA020909 AU076761 AA055872 M81600 D17043 AA070398 N34699 N40348 N31183 AA353394 AA308285 BE293092 AA295231 AA295488 AA314063 BE018838 AA306417 BE385738 AW239325 W52613 BE276244 AA315325 AA316906 BE277221 AA149601 BE276572 AW067924 NM_000903 J03934 AA302015 N35427 AA036745 AA340817 H84385 N47385 BE074524 H96427 AI952067 AW080961 AW362914 AA132625 AW753879 AW362910 AI084728 AA062713 AW373980 AI806855 AA983938 BE220697 AI620265 BE222822 AW087852 AA534386 AW814921 AA577494 BE293548 BE249850 AI346644 AA635970 AI382151 AI073632 AA857008 AA577392 AI539873 AA581987 AI566246 AA683214 BE081776 AI000994 BE081784 AI074406 N24033 AA588838 AI948709 AA053732 AW068386 AI167981 AA132315 AA365371 N27417 AA774708 N27531 AI346769 AI347233 AI380032 N46995 AI356134 AA057318 AA032219 AA302117 AA301949 W58021 W58020 AA032277 AA582804 AI922277 AW797527 AA456436 N47386 AA134055 AW605681 AW613080 AW610575 AA055812 AW805882 AW605878 AW605679 AW605677 N22709 AA494458 AA631158 AI914846 H84386 BE302400 AW579311 AW579376 AI864110 AW377480 AA516430 AW364730 AW176734 D11877 D11593 D11902 D17214 D11882 H39746 BE568335 H26468 AA314338 BE616916 AA037141 BE620011 AI354561 AA921756 AI814684 AA455538 AA020839 AI471351 AA599499 C05934 AW088447 AW789030 AI859018 AW275300 AW789082 AA458634 AI139093 AW069583 W30763 AI768524 AI083754 W47665 T29569 AW951450 H26309 AI753000 AA070399 AI589457 AW002739 AW769553 AA053548 H46590 AW449900 N99238 AI359496 AW073823 H38680 H53637 AI470579 AW084444 AW449866 AI963530 AA852313 AI039874 BE275283 BE293743 BE564450 AA894813 H25860 AA581530 H96428 AI359031 BE180718 D11495 D12071 BE588000 AW578811 AA857177 AW605673 H95750 R84795 AA295677 AW651685 AA295266 H95751 AA890528
108818	12535_4	BE612676 BE388276 AI208592 AI927836 AI434086 BE326593 AI597850 AI631538 AI909963 AW609934 AW818899 AI401754 AI739099 AW800995 F31428 BE613282 BE620259 BE139475 BE620798 BE276918 BE276248 AW081215 AA578055 AI885446 BE390328 AI492209 AI499296 AI696727 AA130984 AW136812 AW117918 AI830323 AA983429 AW170783 AA383935 AW206593 AI468402 AW609931 AW818896 AW393030 AI869005 AI766518 F22059 D80091 AW379617 AI638546 AW474465 AA876495 F35620 AW369856 AI337412 BE503448 AI909962
108846	10505_1	AL117452 AW408005 BE299916 AA135286 BE547298 BE279301 W52878 AA302211 AW957996 AW514270 AI685200 AA928779 AA578884 AA576883 AI218215 AW263592 AA424504 AW082223 AI809292 AI355487 AI265774 AW152614 AA707564 AA933972 N30148 AA927905 AW070728 AI431416 AW606716 AA132983 AA135149 W60086 AA127446 AA247723 AI225124 AI085684 AI630792 BE326510 W40249 W53030 H89149 H80062 AW058274 AI240522 AA595935 AA973544 AA969535 AW298530 AW135145 AI860607 AI334249 AI498814 AI202133 AI346697 AI831564 AA479938 AA992515 AI691071 H80063 N34165 AA455332 N39978 T52099 N88572 AA127445 H68849 AA533580 AW572308
108857	81_1	AK001468 AA190315 AA374980 AW961179 AA307782 AA315295 AA347194 AW953073 AW368190 AW368192 AA280772 AA251247 N85878 AI215522 AI216389 N87835 R12261 R57094 AI660045 AA347193 R16712 AW119006 N55905 N87768 AW900167 AI341261 AI818674 D20285 AI475165 AA300756 R40626 AI122827 AA133250 AI952488 AA970372 AA889845 AW069517 AI524385 AA190314 AI673359 AA971105 AI351068 AI872789 AI919056 AI611216 AK001472 BE568761 AA581004
108880	140977_1	AA766605 AW294190 AA830866 AI954864 AI222410 AI630798 AI633475 AI566491 AA904966 AI223049 AI287382 N50693 BE502927 AW612896 AI252790 AA983811 AI142885 AI268570 AI690020 BE218607 AI870455 AI357770 AA664843 AI185726 AA134576 AW969574 AI301714 AW178717 AW605243 N50778 AA347749
108886	18639_1	AW248434 AI129487 AW377155 H24275 Z42507 R19016 T08307 T08036 AW953119 AA349548 AA393404 AA236624 AL137347 BE274435 AI702126 AI692761 AA360502 R35012 AA478914 AA358981 AA358985 BE080561 AA055316 AA135291 AI195427 H71951 W03891 AA195210 AW021065 D78899 W95359 AW182965 H22883 AI870307 AI091427 AA478795 AI802072 AA595319 AA947028 AW090367 AA553712 AI336846 AI431686 AA055317 AA135153 AW090348 AI128708 AA237000 AI082120 AW084091 AI339737 AI355101 AI207962 AA708821 AA770603 AA400872 R49399 AI468537 AI735393 AW075343 R44087 AI805398 AI805582 W95360 AW138641 R40312 AA349547 AA788856 AW151109 AI950158 AI694090 N73720 AW995868 AW995801 BE062153 AL041833 AW862418 AW860294 AW860326 AI276718 AW860253
102212	13378_1	AW411491 BE299348 AW410636 AW411154 AU076490 AW250287 AW411276 AW250611 AW410456 F12758 AW410459 AW410935 BE622198 BE296223 BE266577 BE297784 AA348084 BE296893 BE270394 BE295191 AW411540 T74720 BE297059 AW411486 BE313720 BE263585 BE266491 BE266415 AA356005 AW246316 BE261174 BE296531 AW248301 BE276614 BE295617 BE392105 AA323383 BE296852 BE267620 BE250281 BE296845 BE262427 AA328132 AW410323 BE298824 AW410237 BE297295 BE294633 BE270112 BE279883 BE019252 BE259626 BE299152 BE255582 BE297961 BE296383 BE293980 AW410723 BE019150 BE019068 BE545633 BE019208 BE019193 NM_005412 U23143 BE019174 H96758 L11932 BE294128 H39749 AW411386 H96748 AA131652 BE398084 W19483 AA747352 AA377688 BE560803 AA410805 R34798 AA323741 AA316917 BE396043 AA131143 AW410724 AL135023 BE294085 BE018423 AA361530 BE250748 BE299994 AA313516 AI653986 AA321590 AI591086 BE299410 T77128 AI951452 AI638143 AI609108 AA369495 AW411251 AW386906 AW082929 R95063 BE297935 BE019318 AW411277 AI691054 AI700140 AW474021 AI887587 BE439939 AI950991 AI625764 AW410822 AA911634 AW411541 AW411176 AW410899 AW411490 AW249463 AI817987 AI597735 AW273145 AI632983 AW249523 AA131090 BE302032 AI569538 AA576614 AA633317 AA165578 AA743215 AI560282 AA586625 AW411487 AW411013 AA328880 W44660 T29731 AI285121 AA640605 AW304985 AI566847 AI247281 AI338283 AA643283 BE208030 AI653600 AI554740 AA564212 BE205955 BE206135 AI090753 AW069245 N70336 AA636134 AW410238 AA100409 AI340965 AW410324 BE205997 AA742919 AI341964 N25590 BE206292 AI313459 AA629927 AI014771 AW411387 W73771 AA989313 AA252291 AA812321 AW173762 AI126885 AI308864 AW410389 AI350355 AW410460 AA728778 AI318431 AA179613 AA219137 AA643582 AW246735 N90299 AW411162 AW411155 AW410517 AW410637 AI268503 AW411492 T76964 AA086186 AA836520 AA912198 AI302489 AW473107 AI865572 BE244857 AA948010 AA888873 AI564941 AW264652 H22828 AA620477 BE205995 BE267512 AI583139 F10366 W44661 AA888553 AI915153 AW075505 AA810043 AA864537 T15483 AA693453 AI313297 AA131470 AA716519 AA630033 AW296682 AA235484 D11830 BE300090 BE299540 AI421521 BE544882 BE297760 BE250390 BE265361 BE300122 AW250477 BE297420 BE264012 AW410898 BE296797 BE300201 BE297914 BE297671 AA243309 AA171436 AA233215 BE294777 BE294766 BE294251 BE300300 BE252525 BE293999 BE296989 BE297380 BE269794 BE269795 BE298565 AA911054 AW950430 AI557895 T82107 N34189 BE251249 BE294902 AA219520 N87314 BE560258 AA102177 BE561197 AW410725 BE295263 BE295043 BE543993 BE297237 BE294403 BE296639 BE297441 AW410516 AW247727 BE300725 AA179614 BE264672 BE297253 BE390715 BE299154 BE297349 BE295105 BE297999 BE298714 BE296553 AW904545

132349	28499_1	AW975654 AA652500 AW973307 AI990990 AA918966 AA918970 AA612829 AW582941 AW584007 NM_003122 Y00705 AA983320 AI660251 AW471481 AA845156 AW005713 AA551894 AA844948 AA586834 AA835291 AA627501 AI302919 AA845077 AA921372 AA569123 AA974970 M20530 AI362622 AI310323 AI459618 AA919095 AA844953 AI362470 AA835382 AA740207
101600	21981_2	BE561617 W37399 AA405963 AA436100 BE393718 AA317393 C19033 C17096 AA365285 AA308297 AW410777 L10138 AA523678 AW328205 AA865267 R55897 W45653 N36027 AI065053 W44608 W44342 W91902 AA136178 AA379874 H38877 AA374479 AA151469 AA305168 C17593 AA305120 D55441 C17625 AA314253 AA211199 AA314589 AA310648 AW328687 AA021359 AA182541 BE565927 BE268825 AA706725 AA158325 AA187406 AI309641 AW006665 AI041213 AW327826 BE073571 AI610917 AW406432 AW600318 AI668800 AI721195 AI440063 BE001611 AI336194 AI089764 AI085958 AA131285 AA164402 AW390484 AI300922 AI031950 AW195168 AA770689 AA300595 AW381349 AW371114 AW381018 AW371113 AW381317 AI857890 AA416820 AL047728 BE620627 AA040552 BE092079 AW474092 BE091920 W73650 BE270992 BE091972 F00585 AL047691 AI038820 AI589872 AW575423 AA416821 AW305222 AA338205 AW575434 AW575384 AA337984 AA337985 AI860434 AW574672 AW410778 AA375029 W45695 BE122782 AI630207 AI630558 AI630580 AA706031 R34806 AA771891 AA771792 AW088662 AA356678 AA379466 AA860823 AI784534 AA356692 AA040298 AA131195 W44569 W37400 AA933570 W58189 AI285471 AA771813 AA774514 AA716769 AI708762 W92042 AA417367 AW371361 AI128895 H02931 AA908594 AA187289 AA643781 AI640830 AW473936 AA436001 AI475021 AI970665 AI057237 AA012954 AI150835 W52421 W57603 AA676596 AI139232 AA579097 AI432689 AA843759 AA573999 AI128740 AA570257 AI131072 AI148346 AA164422 C06015 AI074131 AI032583 AI336298 AA605270 AA782769 W47631 AA021226 AI281342 H04234 AI298277 AW615022 W46975 AI080575 AA040580 AI869185 AW250999 AI174223 AI124799 W60614 AI085737 W45512 N94519 W15579 AA013460 AI300867 W90451 AA021556 AW103801 AW328713 AI168071 AW008381 AI042239 AA158033 AA055893 AA156144 AA182609 AA844304 AA327236 AA676346 AA047883 AI672112 AA383408 AA988468 AI050059 AA939196 AI026759 AI752597 F24182 AA574305 W52183 AA151470 N22910 AI000226 AI926339 H38841 AI289780 BE618650 AI810980 AW801870 AI864364 BE618390 D58020 AW769502 AI272962 AW072096 W15234 AA599174 AA923648 AW842580 AW518382 AA082252 AW074744 BE221061 AW089096 R34699 AA099128 AA033803 AI357526 AI630140 AI123231 AA709402 AA353679 AI864972 AA736798 AW575868 AA661683 F00085 AW023644 AA331174 AA664665 AA369337 AA312279 AA136296 N80820 AL036660 T28180 D56720 AI866433 AA353580 N70710 AW474141 N64463 W58466 M37583 NM_002106 X52317 W23968 R84345 BE296086 BE294435 BE268132 BE391173 BE268771 BE513509 BE263242 BE276783 D19628 AW965243 W90258 AW962703 BE407481 AW406844 BE253043 BE073635 W15620 W47076 W78044 BE259558 BE565194 R00158 AI434559 BE567338 N31298 BE409711 AI752598 AA100988 AA582094 AA902336 BE568220 AA167302 AA018050 AA915972 AA609370 AI184035 AA405697 AI208311 AI536822 AI583135 AI025630 R55812 R85507 AA987581 AA405807 AA082502 T40385 N88454 AA643754 AA093458 R85775 C14737 N24738 W31655 W47830 AA927763 BE268452 W73715 AI984453 H51401 BE537021
102260	25666_1	AL039104 U28386 NM_002266 U09559 AW402355 AA101448 AW673645 AA333467 AA313053 AA361874 AA313055 AA190353 BE266583 AA315284 AA353614 BE384490 BE386729 AA308968 BE003188 AA090577 N87880 AA301121 BE288042 BE408627 AI142381 BE314868 BE385848 BE273720 BE256168 BE386632 BE410675 BE263522 BE294938 BE267422 AW401794 BE548850 BE565744 AA621902 BE260946 BE251616 AA382536 BE311520 AA314057 AW951825 AA306201 BE254429 BE272238 W56840 BE274165 AW813940 AW378582 AW579664 BE274592 BE409321 AA356118 BE275450 AL044404 AA304717 BE312106 BE019375 AW672848 AA329890 AW579677 AW391679 BE084545 AW403233 AA258536 BE167601 AA361542 R15797 R57897 AI110703 AF063578 AW366787 BE395500 AW327848 AA165009 BE085762 BE336673 BE252444 N47847 W25263 R13400 AL121272 AA095442 AW389843 W60329 N84275 BE082474 T67170 BE392974 AA179780 AA209417 BE281033 AW577789 AA489151 AA091107 AA180441 AA367320 BE407196 AA303762 U46229 AW366470 AW391006 AW391047 AW814482 AW391203 AW582144 AW391056 AW391057 AW379254 AW391139 AW391061 AW379196 AW391066 AW379259 AW390978 AW379268 AW379245 AW379178 AW379198 BE148520 AW390942 AW609241 AW390964 AW390948 AW379243 AW609411 AW379142 AW582168 AW391226 AW379162 AW390949 AW390935 AW379155 AW379236 AW379267 AW379186 AW379277 AW379272 AW379184 AW390924 AW582175 AW391223 AW814488 AW609523 AW379199 AW390914 AW379238 AW379203 AW609716 AW391036 AW582165 AW609473 AW379242 AW609492 AW379228 AW391138 AW605882 AW391103 AW609393 AW391037 AW379271 AW379264 AW379143 AW609410 AW379225 AW609378 AW391122 AW391117 AW391054 AW379273 AW609498 AW390967 AW609380 AW390550 AW609452 AW379276 AW609418 AW379266 AW391143 AW390972 AW609482 AW391012 BE080881 AW391136 AW390984 AW582194 AW609703 AW390959 AW582204 AW390961 AW379232 AW379280 AW379163 AW390987 AW391086 AW582201 AW391035 AW390973 AW609715 AW609713 AI205023 AI804287 AA082457 AW391104 AA353581 AI750699 AI862061 AW391083 AA156974 AI026810 AW380019 AW995531 AI200392 AL044405 AW380010 AW602187 AI287654 BE618491 BE464616 AI440158 AI590856 AA779171 AI089353 AW575085 AA707112 AA847455 AW374009 AI276964 AI147354 AW995425 AI718273 AI951157 BE250641 AI023440 AI417555 AW131393 AI280696 AW391183 AA219739 AW391031 W86618 BE081171 AW007734 AA827997 AW176999 AW058184 AA150508 AI590988 AW615610 AA599903 BE301202 AA588337 AI922935 AW731637 BE622785 AI805733 AW675524 AA913189 AW889950 AA641297 AA993290 AI768929 AW379177 AA621830 AI039755 AA489087 AA744568 AA262632 AI873618 BE302060 AA974509 AA568289 AA062970 AW466367 AA913652 BE464656 AA877810 AA180187 AA582440 AA773895 AW795558 AW795767 AW795582 AW795758 AW795632 AI082013 AW249635 AW795753 AI369704 AI826323 AW795689 AA725266 BE080398 AI873994 AA773175 AW993051 AA258327 AA676460 BE080389 AA157068 AI637594 T67169 AA171491 N99904 AW270777 AA757097 AW768764 AA678785 AA126274 AA761881 AA100373 BE207796 AA195448 AA879043 AI754935 D61373 AW072018 AI934178 AW795572 BE439707 AA852239 AW071728 BE205906 AA503664 AA809927 AA180497 AW151358 C21410 R40914 AI940044 AI940046 BE301963 AA640554 AA179767 N32627 AI933456 BE618891 AW390999 BE281046 AW080974 BE622561 AW390970 AW747913 AA365925 BE386502 BE280446 AA187010 AW245180 AU076841 AA379115 AA311979 AA312425 BE018449 AA227391 AA354713 AA134708 AA310314 AA312764 AW402502 AA171862 AW370218 AW378568 AW579674 BE147599 AW391678 N85488 AW403419 AW370229 BE147600 AW579675 BE560488 BE410797 BE263374 AW750357 BE259476 AA156712 R81373 N46428 AW272974 BE279068 AA448770 AA448674 AW513191 BE254526 W86691 N83371 AA304369 R25161 AA207259 AW391008 AW391098 AW512043 AA779610 BE009692 AW609486 AW609711 AW582164 AW391222
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101626	327_1	M57399 S60110 H84344 AA001485 AW160314 AA090747 AI879135 AW163070 X52946 T85031 AI816405 AI990351 AA090718 AA215860 AA318827 N85463 AI970310 D90226 AI611319 R51511 AW239042 AA460816 AA045054 AI797499 AW590267 AA045053 T29639 H14962 H08105 AI338085 AI636574 AW157101 AI934600 S50409 AI870411 AI199056 AW001766 AI870995 AI200327 AI815462 AA548181 AI005058 AI364123 AA919072 AW162280 N67113 AI051749 AA627119 AI335096 AA889349 AA205839 AA033681 AI767032 AI937847 AI078004 AI825162 H95886 AI028531 AA602217 AL047791 AI419608 AI051018 T91979 AW888449 AA460378 AW379087 AW378780 AI498169

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116780	82675_2	H22566 R42536
116787	187589_1	AW362955 H59488 AI040666 W60959 W94209 H27231 T84625 H75715 W04957 W63676 AA659693 AA514302 W63789 BE046412 T91396 AI951970 AW044233 N20018 AW663548 T90114 AI139947 AA809643 AA846232 AA581966 AA789002 AA295134 AW188870 H75644 AA526037 AA347970 AW961788 H61476 AL133779 AA449282 H28581 AA249370
133011	27092_1	NM_006379 AB000220 AW275325 AA853649 AW370858 AW576685 AW370845 AW370862 AW370871 AW748615 AW370847 AA342516 BE081445 AA160999 AL119033 BE078994 AI677829 AL135601 AI962897 W95581 AF086506 AI090512 N38844 AW665569 W95474 AI261434 AI241943 AI536930 D29236 U46406 AA853650 AW370398 D32000 AA042990 AW779930 AA161000 AW516300 AL049019 AA779575 AW338339 AI376746 AW338302 AA977698 AW439148 AI619675 AI814082 AW338965 AI581420 AI866867 AI491966 AI275950 AI540535 AA043044
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133050	12035_1	X73424 S67325 AJ006487 NM_000532 R15273 AA312224 BE409331 AW630604 H15303 AA371184 R25544 AA093267 W69943 M13573 C75158 R09794 AA902221 AA639000 T27895 AW016032 AA553631 AW950067 AA459122 AA687219 AA506483 AI475344 AA507321 BE043326 AI680312 N47467 H93980 AI680311 AA419435 AA680161 W69833 AI758259 R12384 AW079484 AA223335 AI933243 H15697 F02620 AI873805 F02623 AI191766 AI383543 AI371311 BE564628 AI581822 BE544030 BE408707 H93979
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102348	17139_1	U37519 NM_000695 AA773379 AA071510 AA482041 AW170354 AA569888 AA513705 AI188718 AA579992 AA513758 AA481860 AA291695 AA292447 AA443630 AA236671 AA782119 AI352065 AI143450 AI905356 AI909809 AI909789 AW749116 W79586 AW602089 AW602100 W76133 U56857 R25587 AA485853 AW363810 R63387 W79785 W72907 R62853 BE181493 AW371642 R26983 AI252548 AI252283 BE183075 BE410093 BE410638 BE383666 BE407478 BE383743 AA625421
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101753	2533_2	L11144 BE503279 AI340259 M77140 AA760994 AA702835 AW971036 AA492353 AI337122 AW593515
101759	29209_-2	M80244

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101766	14653_1	M80899 AA368768 AA578114 BE182030 AI902286 AI902284 BE281154 AI906505 AW750499 AW604662 AW373288 AW842405 AW842436 AW579777 AL044828 BE272553 AW379988 AL047960 AA088830 AW950909 T28840 R54641 AW382220 BE003314 F00245 BE273339 AL047393 BE158329 T39134 BE007982 BE158322 AA044249 AW748179 BE158266 AW890855 AW630228 BE007980 AI459550 BE392111 AW603898 AL046762 AA665527 BE389329 AW842437 T10885 BE081680 BE007985 AW835201 AA774783 AW993365 AW946377 BE004719
131859	3672_1	AW960564 AA092457 T55890 D56120 T92525 AI815987 BE182608 BE182595 AW080238 M90657 AA347236 AW961686 AW176446 AA304671 AW583735 T61714 AA316968 AI446815 AA343532 AA083489 AW488005 W52095 W39480 N57402 D82638 W25540 W52847 D82729 D58990 BE619182 AA315188 AA308636 AA112474 W76162 AA088544 H52265 AA301631 H80982 AA113786 BE620997 AW651691 AA343799 BE613669 BE547180 BE546656 F11933 AA376800 AW239185 AA376086 BE544387 BE619041 AA452515 AA001806 AA190873 AA180483 AA159546 F00242 AI940609 AI940602 AI189753 T97663 T66110 AW062896 AW062910 AW062902 AI051622 AI828930 AA102452 AI685095 AI819390 AA557597 AA383220 AI804422 AI633575 AW338147 AW603423 AW606800 AW750567 AW510672 AI250777 AA083510 AW629109 AW513200 AA921353 AI677934 AI148698 AI955858 AA173825 AA453027 AI027865 AW375542 AA454099 AA733014 AI591384 R79300 R80023 AA843108 AA626058 AA844898 AW375550 AA889018 AI474275 AW205937 AI052270 AW388117 AW388111 AA699452 AI242230 N47476 H38178 AA366621 AA113196 AA130023 H39740 T61629 AI885973 AW083671 AA179730 AA305757 AI285455 N83956 AA216013 AA336155 AW999959 T97525 AA345349 T91762 AA771981 AI285092 AI591386 BE392486 BE385852 AA682601 AI682884 AA345840 T85477 AA292949 AA932079 AA098791 D82607 T48574 AW752038 C06300
131877	25130_1	J04088 NM_001067 AF071747 AJ011741 N85424 AL042407 AA218572 BE296748 BE083981 AL040877 AW499918 AW675045 H17813 BE081283 AA670403 AW504327 BE094229 AA104024 AI471482 AI970337 AA737616 AI827444 AW003286 AI742333 AI344044 AI765634 AI948838 AW235336 AW172827 AA095289 BE046383 AI734240 W18699 AI660329 AI289433 AA933778 AW469242 AA468838 AA806983 AA625873 W78031 BE206307 AA550803 AI743147 AI990075 AA948274 AA129533 AI635399 AA605313 AI624669 AW594319 AI221834 AI337434 AA307706 BE550282 AI760467 AI630636 AI221521 AW674314 AW078889 AI933732 AI686969 AI186928 AW074595 AI127486 AL079644 AI910815 H17814 AA310903 AW137854 T19279 AA026682 AA306035 AW383390 AW383389 AW383422 AW383427 AW383395 H09977 AA306247 AA352501 AW403639 F05421 AA224473 AA305321 H93904 AA089612 AW391543 AW402915 AW173382 AW402701 AW403113 R94438 N73126 H93466 AA090928 AA095051 T29025 AW951071 L47277 L47276 AI375913 BE384156 W24652 AA746288 AA568223 BE090591 H93033 N57027 AA504348 AA327653 AW959913 N53767 AA843715 AI453437 AW263710 AI076594 AA583483 AW873194 AW575166 AI128799 AI803319 AL042776 AW074313 AI887722 AI032284 AA447521 AI123885 N29334 AI354911 AW090687 AA236763 AA435535 AA236910 AA047124 AA236734 AW514610 H93467 AA962007 AI446783 AA127259 AI613495 AI686720 AI587374 AA938731 AA702453 AI859757 AA216786 AI251819 AI469227 AA806022 AI092324 N71868 AA968782 AA236919 AA809450 AA227220 AA765284 AI192007 AA768810 AA805794 AA729280 AA806238 AW768817 N71879 AI050686 AA505822 AA668974 AI688160 BE045915 AW466315 AA731314 AA649568 AA834316 AW591901 AW063876 AW294770 AI300266 AI336094 AI560380 AA721755 H09978 D20305 D29155 AW821790 BE150864 F01675 AI457474 AW466318 AA550969 AA830788
101793	22080_3	W01076 R26440 AA368372 N47843 R01320 BE005063 N32862 W67442 AW248115 AA186499 W76617 W47571 AL037045 W23808 W32746 AA419065 R81064 H02504 R06492 R63269 N27697 R08672 AA304278 F12437 H68061 AL049058 T73992 W68065 AA374449 W21155 W19598 AA320041 BE005017 T66993 BE620965 AU076485 BE304681 F05525 D58452 X17198 W93173 BE084847 W40177 W19760 AA399092 R64272 D58690 AW996221 AA312068 H08330 M95708 X16447 T83428 R10003 R08968 T79342 R08967 T79029 AA135367 AA373696 W31973 AA313297 R22120 AW951921 W19465 N56627 AI799711 N40576 AW068402 AA095480 AA398202 AW996208 N31962 AA127153 AI174829 W31739 AA375232 AA055145 W48704 M27909 AA046584 N40754 AW993226 AA369058 AA293552 AA402344 AW382179 AA300060 AW612974 W19817 BE302618 AA314768 W93045 AW239503 W61090 AW999043 AA256093 AW996142 AA115108 AA309885 AI185763 N32367 N25809 M34671 AI420645 BE386553 AW238887 AW239180 W63674 BE548657 AW071670 D58480 AW797405 BE385217 AI364331 M84349 AI139787 AW024513 AA568912 AI139779 AI038908 AI148669 AW998134 R69757 AI208594 AA830271 AI207381 AW996121 AA771863 AI582737 AI032005 BE549231 BE563708 AA772626 BE180449 AA478419 AW805577 AA419093 BE545114 AI198458 AI190821 N41625 W17102 Z14113 AA508606 AA362765 AA373248 AA293553 AW405465 N31225 N41424 N41637 AA493320 N20855 AA937576 D59121 AI219373 AI219369 H96383 W72655 AI126266 AW360865 N28679 AW369020 AW996592 AI138204 N90944 N29632 N90945 AI038241 AW339866 AW374179 AI139040 AA772029 R08861 T79770 AA643867 AW374178 N98229 AA115109 AA806282 AA291973 AI311653 AI718795 AA513330 N25868 W31381 AA182822 AA931679 AI095320 R26192 AI359945 X15861 AW996193 AW374176 R82157 AA187355 N34559 AI084000 AW934902 AA725412 N94600 H02505 AI720858 AA641883 AA641929 N94744 W32747 W47405 AA126943 AA255895 AI351787 AW630699 AW364131 BE439522 N95002 H60548 R64159 AA868813 R22063 AA046717 AA136956 AA158339 AA629233 AA304105 T84075 AW385670 AA812268 R16751 R08862 BE085521 AW382178 W04644 T94008 BE002001 AA974884 AW068220 N21290 H98384 AW800331 AA385897 AA890613 N91280 AW800325 F06415 BE166431 AW884534 AA548032 R06439 W47456 AW797813 T93330 AW993666 N98451 AA320303 BE001813 BE085981 N32624 AI206660 BE002637 AA503223 AI797518 AW881523 N90017 BE173234 AA148026 F25032 AW939327 F08000 AA843961 AA781612 F36942 N30048 AI983462 AI829016 AI433050 BE003093 W48705 BE018011 AW131095 W52359 AI951787 AW007755 N63925 AI538776 BE003013 AA593764 AW381247 AI942470 H97117 W47351 AW182890 AI003551 AW371384 AW802655 AW382188 AW024252 AA629009 AA910868 BE168332 AW998776 AW103467 R08578 T66992 AI095458 AW886999 AW080231 AW516979 AA614751 BE002551 AA853472 AA984190 R32050 AI537347 AI141112 AI139141 H08233 AI025834 AA303846 AI375734 AI051006 AI147858 AA977367 AW628158 H60549 AI074055 AI500604 AA973635 AA634239 T82464 N23014 AA132975 AI000277 AI041951 N70220 AI079383 AA136863 W52320 AI086768 AW993659 R96481 R32011 AA828169 AW067934 AI955379 R32003 AI074036 R01207 AA158340 AW804450 AW578099 AA644310 R80956 AA968816 BE218044 AI085088 AI872179 AA216189 AA865163 H97118 AI582803 AA612993 F10059 AA886257 AA058547 AA128374 AA100313 F01797 F02706 AA364790 AA054935 H99289 AA946573 BE621261 AW081853 C01727 AI684016 AW151033 AW516620 AA428471 AA036832 AI623767 AA747910 BE171975 AI696869 AW994421 AW994366 AA384789 AI985986 AA845776 AW087930 AA523314 AI984555 BE005225 AI904908 AW169269 AI904873 AI904877 AW172963 AW371388 AA630182 AA551835 AW008160 AA738219 AI570065 AI570047 W46411 AI272112 AA587684 AA812331 X84805 AI828196 AI215631 AI537453 AI860680 AA614394 AI627925 AW198219 AI961378 AI244401 AA045686 AW304980 AI224995 AA627603 AI986075 AI924326 AI955752 AW087558 AI432057 AI634283 AI609515 AI146681 AI344543 AW304211 AW205578 AW169004 AA937050 AW193044 AW519029 AI431704 AA872165 AW339126 N22956 BE465565 AW472807 AA865296 AI923130 AI827345 AW276416 AA085767 AA302276 AW283977 BE167417 AA148005 AA526475 BE093121 AW192995 AA622459 AA659824 AI276378 AA831376 AI421270 BE301517 AI907305 AI697299 AA906818 AW514010 AI499412 AA135218 AI914839 AI038155 AA463556 AA010944 AA425683 AA853471 AA514760 AA746481 AI284324 F34374 AI572786 AI127733 AW058539 AI074939 AI081411 W25539 AW075640 AA463507 AI264781 AA011329 AI311659 AI074637 AI991415 AI167852 AI167850 T53244 AA053299 T53243 W19297 AA045687 AI954391 AI739254 AI086380 AA614378 AA564541 AA507879 N33392 AI753208 AW062355 T29153 AW589375 AA385209 AW945139 AA564405 F04248 AI424610 D12053 AW571444 AI261355 AW299788 N93550 AI589366 AW611676
124690	109499_1	AW883529 AA062566 R05818 AA365680
109623	493131_1	AW207385 R45035 AI015414 AW027301 AI243732 AI034401 AW593338 AI949909 AA909080 AI827456 AA970506 AA884308 AW469937 AI829671 BE504206 AA991232 AI684476 AA987805 H44342 AW510966 BE047339 F03838 N20155 N33106 N23196 H25554 R69473 T48448 BE326522 N31698 N44929 BE502706
103000	23910_1	NM_001975 X51956 AL120569 BE439816 M22349 AA171840 AW498683 AA101552 X13120 X14327 M36768 W28995 AA101258 AL134109 AA350962 AW163415 AW163031 AA337943 AA319319 AA337294 AA317603 H17983 H09409 AA321839 M86071 AA323310 AA323820 AA081450 AA322007 AW961616 H29112 AA349600 R88470 AA364106 R59230 H46681 R20685 AA325655 AA323983 D55069 AA353305

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103023	21730_1	AW500470 H06789 BE265693 BE267238 F00022 AA227297 AW444618 AA233520 BE245778 N84850 AL121262 AA332218 AA206656 AA134655 AA353793 AA223357 NM_006452 X53793 AA355690 BE254225 AA113953 BE567105 AA373150 BE265222 BE263481 W00332 W20277 N50288 AA356027 AA356432 AA460418 N44764 AA247578 AW603811 AW504855 BE076335 BE535963 BE269055 BE397245 BE207045 R09643 AI524157 N84718 AW750310 AI831649 AW405272 AI608776 D17057 N39761 AI888656 AI630141 AA580499 N26422 AI190574 C19003 D59142 AI934377 AW197655 AW615490 AW770227 AI824301 AI826408 BE613833 AA704469 AA775648 AI871083 AI139200 AI343919 AI364058 AA961406 AI279685 AA169611 N47076 AI589192 H06740 R09530 AI289838 N33274 AI796372 AA773848 AA773403 AI915935 AA564395 AA740678 AI678147 BE176079 AA211898 AW386211 AW604702 AW604700 AW386212 AW388355 AW386354 AA343674 T29717 AW608858 AW754321 AW604707 AW604706 AW604704 AW608862 AW884475 AI470768 N92698 F00491 AA115600 AA210804 AA488215 BE546534 AA090884 N77356
103058	29185_1	X57348 NM_006142 AW582031 AF029082 AF029081 AW246932 AA191264 BE122880 BE207235 BE563646 AA315939 BE264906 W79136 BE542511 BE615170 BE539669 BE616059 BE279710 BE512901 BE512933 M93010 AW366988 AA315717 AA158555 AW050862 T28709 AW605359 BE293089 AW366532 AW382384 AA064692 AW579542 W81148 AI834243 AA191692 AA641135 AA584037 AI283995 AA593934 AA586733 AA553800 AA838220 AA158556 AA837904 AA552598 AI608618 AW874282 AW081937 AA513205 AI672841 AI356363 AA554950 AW950173 AA308350 AA079732 AA826814 W81149 AW085653 AW269520 AW117948 AW268370 AI969260 AA858392 AW273771 AI354364 AA064650 AW250794 W74461 AI864911 AW087957 AW191846 AW050960 AI802687 AW780270 AI474308 AW516830 AA639425 AW117923 AI857657 AW615768 AW170288 AI354963 AW050763 AW004962 AW079623 AA662510 AI611709 AW117738 AA642581 AW272971 AW801049 AW383834 AW265603 AI832277 AA595966 AI541056 AW246006
103059	23881_3	X57351 AA654929 X02490 BE395406 BE563953 T58724 T73065 AW950205 AW994424 BE157475 AW362565 R28460
103076	13655_1	NM_001034 X59618 BE397747 AW503980 AA354118 AA053592 BE514224 BE299426 BE513582 BE297738 BE397292 R95694 BE278429 BE257685 BE613857 BE294663 BE297225 BE292916 BE541841 BE295916 AW239036 AW749733 AW578617 AA187351 AA355709 AW859845 BE297013 AA353332 AA204976 AL120944 AW602526 AW602512 AW750201 AW382889 BE297806 BE293922 AA127256 BE088525 W88898 BE314935 AA188218 H89781 AA403012 AA994536 AI890682 AA304649 AI417572 AW960352 AA702000 AW794142 AI436182 AW473401 AA602545 AA703261 AI831084 AI240268 H89828 H67307 H61911 AI864599 AI032997 AA676787 AW104792 BE208774 AA742288 AI038609 AI365040 N76870 AA703221 AI754744 AA720701 AA127257 AI336455 AA053076 AW378124 H68517 AA702787 AI139965 AW378095 R95695 H89719 H49073 H90680 T17364 AI444936 AI273823 AW673307 H61707 AW778803 T29749 N87596 AA094084 W88654 AI124036 AA046748 AA779414 AI088527 AI074626 BE537223 BE387242 BE396359 BE295232 BE407493 BE298019 BE299374 BE269901 AA186365 BE298410
133167	4750_1	AW162840 AB011103 NM_004522 AA082585 BE093611 AI651976 AI990737 AW274812 AA325221 T82293 AW614011 AI673309 AI825446 AI699538 BE378554 AF010146 AL046486 AL119071 AI360266 AA580023 AL117393 AW298309 AA332807 AL050070 F11613 M79073 AA081545 T31178 T08358 AA204758 R12072 R15408 AA525065 AA226736 AW995415 AI698127 M62096 H14852 AA541529 AI301724 AI206957 T31267 F09268 AA082009 AW901553 AW901551 AW161605 AA625394 AW901566 AW163345 AW952148 AA319264 AW901574 AI369327 AI366377 AW901577 AW901576 AW901564 AW901578 AI268343 AA878238 AW901575 AW901554 AI810179 AW157290 AA769070 AI302273 AA219660 AI911086 R16149 BE326393 AI078091 N66104 N98707 AA992327 AI290174 AW161945 AW089620 AI216528 AI222342 H92203 AW148612 AA206916 AI032253 AW089301 AI215708 AI214776 F26734 AI802009 AW901573 T16535 AA227443 AI424347 AA602178 AI418719 T16606 H14818 R37133 T06093
103080	17092_1	AU077231 AA852219 M74092 X59798 M64349 NM_001758 AA226806 M73554 BE409154 AA160096 BE384352 AA160820 BE382880 BE261734 AA113821 BE407745 AA156380 BE390287 BE390020 AA100854 AA127152 AW794066 AW387101 AW367093 U47703 AI347077 W05266 AI824103 AI499061 AA642944 AI042556 AA906539 W60380 AI571777 AL135581 AA112340 N75459 AA592929 AI085348 AI278890 AA126942 AI023701 AI873252 AA156319 AI190622 W60289 AI274886 R81309 AA100801 AA227161 AI568929 AA160603 AI074344 AI344561 AI150778 AA852218 AA158286 N20142 AA622148 AA864225 AA576367 AW182124 T89175 AI758455 AA780573 N71757 R81200 AI659596 AI674613 AA642544 AW503909 AA128851 W39350 N40420 AA113072 BE168116 AI620604 AI298125 BE075272 N40078 BE075109 BE080779 AI918938 BE168117 BE087369 AW995539 BE080949 BE080727 BE075271 BE075108 BE080955 BE089655 BE081115 AW750304 H66084 AI146884 BE075154 AW992247 AI186525 AI752230 AW263140 W03329 N26056 AA948080 AA113073 H99284 AA227101 AA631077 AA148042 AI740837 BE082728 AA149570 W44495 BE089351 AA375044 N26775 H27771 AA064705 BE091204 R89337 N32676 N27141 BE164704 H98049 W67603 AA425549 W31090 AA807411 BE173280 BE000178 T09020 W23852 AA062709 BE167894 AA076515 R97329 BE541980 N42086 AA102307 AA113772 BE276181 H20622 W44436 W67604 W46412 AW771113 AI700678 AA502628 AA133137 BE274186 BE396090 BE613371 BE612645 W46650 W95203 W92651 AI087288 R76299 AW604781 N55320 AI912334 AA403248 AW169156 H24970 AW298822 AW080962 AI073747 W24123 AA577596 H21715 H27925 H26436 AI288304 AA148043 AA204678 BE047090 W48631 AA908347 AA599485 AI276505 AI953979 AA563710 H25674 H51747 AA425389 AA516104 AI095335 T77237 AA151696 T92084 AI689037 AI624162 W49709 AW514883 AA100676 AI366087 AA069474 AA525859 AW771076 AA029402 AA994114 AI351505 AW770816 AI333594 AI289794 AI346589 AA487700 AI081104 AA613344 AI377520 AI284911 AI311390 AA622062 AI055890 AI660881 AI366117 AA403090 AI272818 AI073353 W46300 AA062689 AI755078 AI753397 AI633564 AI273471 AI339890 AA699584 AA983722 AI079968 AI752231 AA076431 AA113245 AI168564 AA918965 AI066484 AI123599 AI921518 W94586 AA535600 AA064665 AA705388 AA064623 AA962503 AI924926 AW131206 AW275281 AI280632 T29597 W48728 AW954336 W38317 W94768 AI084717 W46567 AI245645 AW302501 N72201 AW510563 AW079132 AA207064 AI143740 AW440672 AA632154 AI290286 AI350704 AI271377 AA025369 AI864756 T77451 H97348 AA852165 AI932951 N98526 AA487486 R92970 AA934071 AI080448 AA063257 C05786 N99099 R42969 AA887065 AA662686 AA533833 AA662304 H51748 BE539444 AI382164 AI814595 BE537043 AI168307 BE408935 AA453606 R89428 AA936527 AA936890 AW369618 AW264602 R18074 AI474189 AW372354 AI094358 R37210 AA948510 AA226909 BE172527 AI086652 BE408324 AW292848 AI768962 BE540703 BE409478 AA931692
132543	4172_1	BE568452 BE297396 AA449593 AW732490 AW069736 BE548667 AA207229 AF044588 NM_003981 BE268994 AW444578 AA471151 BE250747 AW732555 AA074582 BE336856 AW408764 AA191159 BE092129 AA310614 AW958677 AA312276 AW750027 AW750046 AW750032 AW750024 AA188893 AW750054 AW408409 AW750030 BE151875 AA478509 N58721 AA195614 H70079 H75580 BE250401 AA454518 AA007263 AA626405 AA417152 AA004230 AA557354 AW863151 AW863181 AA702179 AI924143 AI671185 BE006198 AA190630 AI638795 AI609113 AI056239 BE537023 BE464668 AA634413 BE208066 BE208833 AW250803 AI337375 AA478510 BE501624 AI814763 AW594726 AI091408 AA827285 AA189108 AW594169 BE618589 BE618040 AL135398 AA632206 AI080126 AI638180 AA725439 AI379107 AI288872 H14801 AI679151 AI263619 AI559213 AI679722 W93249 AA552345 AA417030 AI969543 AA534494 AI038181 AA766364 AA573241 AI754325 AW043937 BE207865 AI291838 N73585 N73539 AW805051 AA808510 AI699813 AW166044 AW104716 H05808 AA248270

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102469	28114_1	AF058293 NM_001355 U49785 AW972510 AF012434 AW162262 AW160759 BE467297 Y11151 AV660796 N36451 AA031856 AA042840 U84143 AA298360 AW245227 AA029537 BE503111 H40824 AA314623 AW967178 AW249699 AV654359 AI816320 AI816115 8E383088 AI816155 AI816242 AA904633 AI857562 AI674662 AA641797 AV661233 AW591120 AA135692 R73165 H22050 AA292995 R74444 AI090155 AI280954 AA995535 AW664217 AA702434 AA897591 AI938198 AA897622 H87967 AI524130 AW593345 AI245949 N94421 AA778106 AI500225 AA315056 AA505428 AA641740 AA916226 AI475784 AI806488 AI674765 N25737 AA946564 AA973960 AI738576 AA741247 AI141160 AI221510 AI743909 AI394171 AI857553 AW005215 R22955 AA766589 AI884977 AA397824 AA913449 AI343606 AI365262 AI739170 H67915 AI304569 AA926749 AA031857 AI266691 AA938649 AA618497 AA723513 AA596001 AA470895 R73113 AA135724 AA703615 AI282652 AA865014 AA554895 AI076871 AA029470 AI791608 AA953956 AA523248 AW797855 AI567853 AA723757 AA228918 AA229626 AI688392 AI868189 AI202062 W42762 AA876330 R26067 AA548143 AA044388 AW272276 N56172 R54763 R70265 R23061 R23472 AV646146 R62911 T56208 T52223 AV661866 AA247611
131913	29330_1	AW207440 BE550098 BE222538 BE467911 BE502972 AW770991 BE348491 BE464713 8E464895 NM_003676 AF002668 8E382402 AW239002 AA352894 AA188319 AI929163 AW239144 AA308032 AA545785 AW383672 AA486501 AI905278 AA360802 AA427347 BE162891 AA339634 AA504320 T47547 AW608185 AI928909 AI826360 AA039957 C16051 AA186666 N26205 AI802485 AI929789 AW264512 AI766895 AI581200 AW881675 AW881634 BE170014 AA039929 R91936 N22526 AA809857
101840	28941_1	AA236291 BE293174 AF053630 BE246925 AU076563 AW192831 M93056 AA317328 AA285297 BE549077 AA459452 AA828086 AW867040 AW367439 AW579513 AA381538 AW373811 AW238408 BE181033 BE177198 T64083 AA223079 T29877 AW951546 W52888 8E158927 8E164641 AI819486 AW861145 BE617585 BE080588 AW604529 AI686584 AW853099 AI927997 AW076085 AI609287 AA554776 AW272186 AI697982 AW168740 AW407049 AI651260 AW276041 AW361042 AI749476 AI597941 AA563899 AA596013 AA236225 BE551322 AA996154 AI914153 AI701599 AA747840 AW795777 AA627978 AI697344 BE219518 AI768049 AI379098 AA489298 AA465675 AI755246 AI498642 AA583755 AW753489 AI478385 AA486275 AA009870 AA837593 AI921918 AW342108 AI344412 W60096 AI749707 AW058301 AI640325 AI074661 W60162 AI274417 AW014165 AI908601 R54664 AI762419 AW874141 BE539228 C01662 AW615332 AA640019 AW515606 AW853015 AW467918 AI932439 BE241436
131937	83422_1	AI907735 AI056357 H51345 AI432456 AI140962 AI524059 AI421702 AI082401 AW291316 AA009744 AI361578 D60684 AI361496 H50507 AI278076 AI572596 AI247598 AA678199 AI750926 AI584110 D60243 AI431834
131965	50779_1	W79283 AA355584 W55924 AW295902 AA303712 AI762203 AI933087 W86119 AI344052 AI394685 AI380136 AA906535 AI831090 AA587379 AI082049 AI392742 AI024509 AI341096 R98391 AI277506 AI401129 W90323 AA976794 AI493269 H75427 W90146 AA682644 AI002148 AA625829 AA927077 W86120 AW965770
101883	13982_1	AU076743 C03916 C03241 C17133 AA213939 BE080490 BE080506 L06849 Z32770 AA040112 AV653149 AA034144 AI207499 C03888 AA040113 AI079565 AI079561 C05003 C05006 AI133623 AW629601 C04222 AI040781 AA442031 T58253 C04562 AI630563 AI630360 AA360674 AA923252 N45238 M98399 BE568579 R67556 R09416 N78180 W86398 S60720 W52503 R36333 AA603206 AW613186 AA779254 AI818595 AI807199 W52687 AW081753 AA700589 AI023824 AA873267 AW044569 AA846141 AA916502 AI805330 AI539625 AI242149 F33247 AI140485 N39161 R93521 AW450111 N99618 R30819 R33521 T28585 R35967 AA708427 AA417874 R26399 T93071 R09417 AA342353 N59627 AA446923 AA482528 AI253633 R33425 C17897 AA461273 AA302823 R83148 AW954323 L06849 AW662129 AI418452
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131991	9877_1	AF053306 AU076682 AL134922 AF107297 AA332513 AF046918 AF035933 AA333217 AA334907 AW502700 AF068760 AW960388 AW175635 AA314793 AF046079 NM_001211 AA134622 AW674724 AA237061 AW967437 AA488324 AA310114 AW965733 AA057453 BE005410 AA436067 W85770 AI949025 R83561 H71285 AA358471 AA447460 AA194971 AA024423 AA431252 AI655861 AA195039 AW339247 AW339252 AA491096 AI742609 AI801073 AA379706 AW958400 AI742619 AI142090 AW027512 AI655899 AI954788 AA252443 BE538707 AA527377 AA625902 AA236861 AA694249 AI086191 W85771 AI378561 AI073565 AA024424 AI056214 AW452190 AI183487 AA490909 AI248560 AA812042 AA251909 H53027 AA715728 N76108 AW449857 AA488460 AI472342 W05597 T70279
103110	3165_1	X62822 NM_003032 AW503875 AW503871 X54363 AW500693 T87101 AA362158 W86368 T87100 AW500756 AA650479 AW505326 BE174653 AW408118 W86304 AW502416 AW502929 AW503986 AW386276 AW849346 AW849661 AW386237 AW408111 AW408065 AW503146 AW505584 AW501997 T40033 BE513321 T28127 AW950356 AW408733 AW888934 AW888935 AW408672 AW408139 AW408632 AA053191 AF007133 AW402986 T77105 AW607384 AW607226 AW389924 AW390030 AW390003 AW389914 AW389867 AW389905 H50737 AA173350 T85522 T84687 H61889 AA973060 AI827819 AA918297 T78698 R92173 T93773 R00114 AA765771 AW401612 BE092769 BE092751 AW405380 AA101896 AA150821 R10651 AV659513 AA132785 AV659504 AV659244 AV659402 H26119 AV649190 AV649382 R47460 H71379 AV650337 AV650310 AA291331 AW604183 W05049 AA526109 AA525891 AV658596 AW841979 AW841956 N78404 AA081318 AI743792 N39564 AI423316 AW574865 N50105 AW505324 AA176779 AI871039 R91746 AI832017 AI760310 AW575698 AI418288 AI146395 AW474464 AW518261 AW575766 AI831651 N70182 AA740174 AI383512 AI146405 AA327270 AW575779 AA804742 AI694007 AI086143 AA017439 AA725101 AW026365 AI638127 N62633 AI422886 AI094994 BE047172 AI432658 AI347718 N92153 AA886337 AI084853 AI864682 AI888006 AI400481 AA805585 AA714723 AW575739 C06044 AI242399 AA099435 N92154 AA598652 AI340010 AW305208 AI687213 BE221126 AI357202 AI367737 AI222491 AI422563 AI671750 AI865161 AI282392 AA053105 AW977848 AI678203 H26384 AI888547 AW236757 AA969788 AA931708 AW189296 AW104122 AW576574 AA508883 AA886334 AI091462 AW194366 AA983578 AA081319 AA659236 AA507105 AA706401 AA262158 T40957 AW576519 R38174 AI420189 AA740663 AI362399 AA493825 AW243101 AI682049 AA983307 AW591806 AI474216 AI276413 AI243962 AW771756 AI469023 AA677442 AI865219 AA736532 N74338 AI914927 AA491775 AA665867 AI684948 AA577242 AI928042 W72106 AI243044 AW503191 AV647329 AA004332 AW389897 AW389912 AW389887 AW389902 AA004331 AA642384
103119	3394_1	X63629 NM_001793 BE175433 BE153414 BE153425 AW364593 BE315317 AW950190 AA314252 BE142943 AW365220 AW368405 BE004269 AW366568 AL040609 AI829273 AI591168 BE146183 AI631060 AI830793 W78081 W92295 AI927422 BE009313 AI371793 AW993031 AI204659 AA535113 AW993030 AI190281 AA555159 AW269637 AW993146 AI149268 AA425217 AW473194 AI890930 AA551993 AI952106 W92308 AI827275 W45400 AI952328 AW609233 AA774611 AA551779 AI913967 AI798658 AI537658 AW517535 AA632236 AW339148 AW589522 AA836945 AA961263 AW015821 AW272946 C00249 W40333 BE143121
103131	3455_1	BE536069 AW393633 AA136789 AW821689 AI834350 AA506274 BE070170 AW821678 AA308168 AA488630 AA131149 AA131160 AI151190 AA308062 AA308355 AA369141 AA534869 AA187915 BE565360 AI148603 AA369104 R76868 AW610308 AA131104 AA130897 AI014579 AI023329 AA314934 X65614 AA622025 NM_005980 AI803595 N41659 AA486010 AI814221 AA552131 AA630697 AA040009 H95165 AI928285 T47376 AI219000 R32242 AW951766 AA780629 AI096571 AI096563 T47401 AA308192 AA126381 AA136673 T47377 AI202505 AA594486 AI815174 R32189 AI200563 AI219279 AA587763 AA128186 AA187916 AI318167 R82349 AI318308 AW393634 W02707 AA484318 AW796740 AW881434 AW881366 AI126103 AA039888 BE067072 AI433932 R82833 AI142659 AW392947 AW392945 R82404 AA053504 R82832 R77101 W25661 T47400 AA622076
103145	26690_2	X66276 T75145
133240	31972_1	AK001489 AW860676 AW821784 AW975085 AW821786 AA658188 AW468490 AA410271 AA152126 AA452028 AW473972 W16475 AI475944 AI360390 AI357567 AA226320 AW874359 AI122554 AI091013 AA406478 F37355 F27660 AW439053 F36093 D31309 D31031 AI686163 D31161 D31474 D31095 AI291610 AI866679 AA662158 AA911580 AI302576 AW169600 AA905362 BE327258 C21179 AW969418 T81369 AI076608 AI313185 AI590307 AI017439 AI985266 AI092621 AA393816 AA609830 AW086045 N98729 AI739354 AA455083 AA493714 N36233 AI870707 AA235859 AI082534 AI569628 R42309 AI569818 R79440 AA480260 AA622011 AA858240 AI473130 T10194 C21521 AI245327 BE168785 AW379568

103177	10888_1	BE244377 AA338310 X89141 AI929380 AW410861 AA351268 AI929004 AA132850 AI816348 AI815503 AW403408 AA312277 AA311923 AL036928 AW163229 AW161244 D52720 F07128 AA223128 BE392377 AA305886 AW247747 AA332907 AW950937 AW160538 AA311963 AA356171 NM_004462 L06105 U47709 R11849 AA232463 AV645555 AV645525 AA053619 BE408788 L06070 T72123 AW601882 T86062 AW374302 H23317 AW176438 R07232 AW849553 AA352210 AW849234 H44685 W94208 AV653813 AA332023 AW250706 AA102094 AA321563 H29164 AW277021 R55980 AA355314 AA360928 N76776 W48614 AA026281 N23771 AW377275 D53282 N28452 H75676 D54754 D55368 D55402 BE181975 F07893 AA355322 BE566904 AA148259 T19343 AA193069 AA083979 AW404668 AA131541 R02406 R08392 AI669055 BE174166 T99624 AA985358 AA985342 AA131697 AW246850 W63788 AW601918 AW074311 AI951130 AI991110 BE070315 AA151763 AI032815 AA613379 AW182204 AW265712 AA747801 AI190719 AA430164 AI494088 AW131526 AW072023 AI004081 AI144397 AI301484 AI590672 AA970146 H99689 AI928778 AA928418 AI815800 AI816268 AW574757 AA102095 AI890190 AW340641 H62539 AI417393 AI608972 AL041908 AI872231 AI984699 AA317075 T99625 F24396 AI161392 AW162148 AW518979 R08341 H48776 F36841 W92663 AW161779 R83726 AW885483 AW440322 AA541604 AI908605 R59607 AW270365 R07180 AW273047 AW162487 AI052719 AW007925 AA366437 AW515604 AA206134 AA322919 AA838608 AW571844 AW023321 AW732262 AA220926 AA405177 AA564787 AA364610 BE220511 T71979 AW157224 H12389 AI990979 T72210 AA857354 AA292662 AA625743 T87002 AW058112 AI312077 AW969444 AI218167 AA534735 AI908780 AA401454 AA947906 AW406988 AA864810 AA483282 AW170751 AW080972 AA830202 AI151023 AA181703 AI914655 AA889601 AI905706 AI201824 AI141932 AI680401 AI283019 AI365250 AI276334 AW410862 AI056909 AW102782 AA807321 AI185943 AI920812 AI140684 AI378069 AW000855 N57455 N27435 AI741814 AA192920 AA026282 H43629 AI183784 AA563831 AW377321 AI084030 AA074123 AI318047 AA053173 AA872727 AA133110 AI929302 AA132757 AA232267 AA129857 AI033785 AI346414 AA148621 AI925122 AA932952 R51330 H08557 AA083810 AA129337 R55981 AW002267 H99629 AA625742 N53963 AA772739 T29282 AI859385 AA223244 AA523979 F28431 W48847 R36966 AA657829 N27973 AA916090 H62606 AI952754 AI564458 T26604 AI468917 AW269805 BE221068 AA569016 H23205 W92664 N20092 AW248053 BE041312 N34384 BE042592 F03417 AA129296 AW298264 AA579647 AA628870 AA173312 N35395 AI815203 AA148258 AW976758 AA927356 AI915614 AA351267 AA534648 AI625062 AI587520 AI582856 AI954097 AI609091 AA766770 AA741469 AI685416 AI719555 AW510313 Z20271 AI251431 AA338309 AW513955 AI804795 AA550813 AA846149 AI453329 AA194782 AW592900 AI140151 N29512 AI742951 AA566029 AA679352 AI336457 H69031 H29061 H12335 AA018590 H48777 C21353 AI698328 AW473013 AI860131 AI679762 T92179 H27238 BE265616 D52299 BE615720 BE614759 BE545737 AA074684 AA089952 D53006 AA232397 AA148760 AA182533 AA232066 AA243199 AA017339 AA018779 N94178 AA071301 T72989 R11772 BE387096 AA773305 BE379275 AW512721 BE256922 AW849540 AA861806 BE250923 AA149746 AI672946 BE565676 AI249672 AW377375 AA380648 AI475401 R11842 AW160619 R02307 AA017065 T85654 D56357 AW367156 R36960 D54522 AA211025 N59047 AA095616 BE268345 AI950148 BE148896
102522	28935_1	BE250944 BE616901 BE253022 U53347 BE383374 BE313477 AF105423 NM_005628 BE257654 BE336665 AF105230 BE539413 BE273212 BE617083 AF102826 BE274027 BE560310 BE614911 BE273445 BE513318 AW411160 BE278757 BE277970 BE019285 BE531331 BE336692 BE397340 BE296944 AW602538 AW602540 AA099481 BE336620 BE074605 AA306259 BE535395 BE207595 BE207598 AW410410 AW841604 BE305060 BE311530 BE292788 AA306349 BE514955 BE313327 W90214 AL121171 BE539828 T11057 H30086 AA297427 BE514907 AW580873 BE262194 AW580793 AA852674 AA321171 BE074021 AA346337 AA308071 AA309759 AW410411 AW967163 AW411161 AA228909 AA308363 W05341 AI660835 AW999568 AA564660 AI684985 AI660215 AA503541 BE504576 AI633136 BE208096 AA845686 AI288924 AW778797 AI184170 AA977438 AI955727 AI674510 BE208366 AW054876 AI469116 BE300996 AI095478 BE465612 AI860201 AA989620 AW467514 AA098963 AI673787 AI357188 AI446031 AI268863 AW270531 W90118 BE042532 AI932802 AW674178 AI498985 AI698310 AI973241 AA565892 AA618535 T70098 AA701617 N75549 AI801071 AI915998 AI824519 AI453680 T70031 BE043320 AI248317 AA852675 BE208054 AI129615 AI672245 AW517529 AI934217 AI916491 AI932648 AA580366 AA229618 AI003710 AA362311 AL121564 AA605241 T10696 AA612586 AI669543 AW205845 AA862570 AA468628 AI685640 D20937 BE562427 BE616976 BE541016 BE548292 BE617036 BE251847 BE292877 BE386108 BE539045 BE262916 BE544850 BE261696 BE314491 AW168666
132618	4291_2	AL050025 AK000158 AI908611 AA252048 AW608281 AI908261 AI908258 AI908239 AI160656 AA536091 AI040024 AA026961 AI817577 AW167656 AW805905 AI972086 AW275904 AA633511 AA253330 AI459474 AI991230 AI344436 AI566311 AI200550 AI572667 AI306458 AA938254 AI572658 AI301480 AI986336 AI300709 AI832269 H05110 AA643555 AI050855 AA505873 AA588865 AA253331 AI421242 AA970741 AA740337 AA953925 AA918856 D25681 AA600883 AI306664 AI271982 AA853781 AA975599 AI908238 AA670219 AI799962 AW170074 AI355477 AA962472 AA853646 AI918513 AW051036 AA873683 AI672142
103195	3223_1	AA351647 NM_001958 X70940 AA351455 AA325548 AW248144 AA351834 AA349397 AA326028 AA338341 BE208623 AA323302 AA339035 AA338365 T08068 AW966573 AW966578 AA351470 L10340 AA188990 T28797 F00492 AI929597 AA158068 AA984807 F00611 AA776020 AI816044 AW732219 AI192682 AI937488 AI368766 AI498010 AW292877 AI381320 AI468632 AI674175 AI955204 AI693207 AI805987 AI928581 D53815 AI803715 AI814727 AI335757 AI480079 AW207047 AI879505 AA553537 F24119 AI017726 AA604272 AI479397 F30442 D51525 AA706359 AI271525 AA232098 AA973543 AI379683 F27731 AA191040
101971	24390_2	Z49105 X86175 AL040237 Z49106 S79894 U90840 S82471 U90842 AA609599 AA312651 NM_005636 U90841
124847	26986_4	W07701 AI133664 AI290816 R60044 AA693963 AA493715 AI336061 AI610656 AA693599 N80579 R83001 AI473847 AA633037 AA618329 R82959
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101992	15051_1	X90725 U78073 X73458 L19559 AW250659 NM_005030 X75932 U01038 BE301830 BE297455 BE297942 AL040830 BE264516 BE206963 BE545110 BE296425 BE385706 BE273449 BE559796 BE253122 BE254880 BE257891 BE263475 BE273841 BE273308 AA306560 AA331492 BE087719 AW250291 BE087061 BE270383 BE295183 AA380290 AA088731 AW401457 AA043829 AW367195 AA456458 BE260078 AA353672 AA553803 R99809 AA352574 BE614593 H52663 AA327248 R01014 AA193662 T28955 AW950886 AI916283 AI916294 AA206364 N58651 AI949492 AA846584 R68910 AI765140 AW590607 AI949066 AW249935 AA580473 BE140378 BE300829 AA193513 AW615819 AW249527 AW732067 AI936720 AA454565 AI218478 AL040831 BE502128 AW246796 AW251086 AI275562 AA808283 AI923618 R99810 H52664 AI370033 AW574528 AA629262 AI905018 AA088730 AI798262 AA694425 AA852582 R01015 BE504899 R17934 AW207180 R68806 AA205518 D29396 AI867265 BE463980 AW079339 AI497713 AI590016 AI221870 AA991721 BE560361 BE259912 BE563868 BE538225 AI652630 AA088732 AA806326 BE535599 BE277725 BE542387
117642	24585_1	U55184 C16033 N46366 AA478853 AW162080 AW450573 AA235429 AL120649 AI082827 BE504287 AW156895 N37055 AI452450 AI827985 AA973921 AI078763 AA479952 AW263536 AA234773 N37076 L10665 NM_002071 H49600 H41799 H49592 H43011 H41837 H49694 H49683 H42188 AI277641 H42191 AW960075 D54398 D52975 AI024119 H17636 C00861 R20102 AW138751 AW237500 AI743654 AA642492 AW044105 AA876365 BE242003 AI693444 BE218931 AI693433 AA492549 AI687074 AI241026 N20828 H77392 AI582745 AI362752 AI989343 BE169365 R52708 AA946636 W40411 H77393 AA488909 AI864923 BE169804 AA487362 AW841219 H05313 AI382931 AI623550 R39198 AI625086 AA728766 AA206921 T15418 F10584 D53449 AL047642 T28449 AA418957 H43008 AW389735 AW389737 AI242468 AA418749 AL134374 AA827103
111003	1470402_-2	N52980
103240	3332_1	U81961 NM_001038 X76180 Z92978 L29007 BE563144 AW752323 AW605213 AW379740 AL036530 AA393950 AA035472 AW249071 BE264628 BE293100 AW974278 BE315490 T28389 AA402773 AW796814 BE001985 AW366994 AA482625 BE093028 R48145 H39921 AA459197 AW363013 AA516464 AA535868 AA402792 AW249694 AW024917 AW178791 AA477362 AI453273 AI885511 AA573425 AW080449 AW190184 AI588881 AI673588 AI804876 AA551653 AW070576 AI261669 AA861895 R48146 AA641560 AA931735 AA812330 AI289786 AA435775 AI017803 AI699795 AA630143 AA834340 AW152290 AI445126 AI337246 AI263551 AI860441 H28438 AA477114 AA885926 AA480364 AA573919 AW247908 AW005377 AA565785 AW007565 D45514 AW578023
103245	9107_1	BE566343 W25304 N40150 AA033594 W47498 AI348655 N99949 AA011573 N99929 N27026 AA129941 AA766447 AI005601 AI244046 R92122 AI288824 AW074285 AW803318 R81375 AA037205 R32183 AA485073 AA032078 AI022356 AA614770 N47980 AI245088 R92198 F33995 AA665163 D11582 H90397 R69363 R39568 AA129940 AI431751 R26829 AA279280 AW995850 AW995819 AA999877 AA639489

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103262	30537_1	X78565 NM_002160 AW849271 AW849284 BE070169 M55618 X56160 AI752274 X80280 AI752783 BE085280 AI752359 AI752537 BE085357 AW368385 M24630 AA121587 AL135594 AA376236 AA852426 AI752223 AW993043 AA386040 AI752360 AI752581 AW362299 AA219366 AI751903 AI929763 AA852556 AW381589 AW360945 AA375942 AA331744 F13432 AW068004 AW838635 AA223678 AW608183 F13016 AL121433 AI751856 AA344557 AW602147 AW602064 AA037441 AA130202 F13253 T77030 AI751122 AA037359 BE185561 AA134100 AW378339 F08068 AA324181 AW378350 AW378348 AA343458 BE166503 BE175117 AW378344 W47114 AW367718 AA461289 AA293732 AA373768 AA374344 AW749923 AW749934 AW602133 AW835290 AW937984 AA331126 AW937992 AW385977 AA448991 AW378075 AI084804 AW581359 AI312592 AW839221 AA328705 AW176725 AA046543 AW840706 AA070776 AI560816 AW889297 AA693461 AI016493 AA373039 BE162918 AI554313 AW004826 AI569405 AI419439 AA665773 AI828468 AI956098 BE504589 AI767273 AI684182 AA293733 AI473804 AA483299 AA340821 AA873749 AI869519 AA045473 C06097 AA505504 AW104511 AI281389 AA678558 BE551784 AW183737 AA725001 AI222869 AI751121 AI498613 AA598955 AW511819 AA746094 AI783501 AA857548 AA460980 AI183689 AA223510 AA993812 AW608353 AI751857 AI272689 AI090084 AI291427 AI185072 AI341799 AI150420 AI624079 AW075585 AA223394 AW511803 AA665468 AA903413 AI752782 AA679727 AI752273 AI061274 AI049690 BE464029 AI369788 AW628681 AW889130 W52099 AA968750 AA121393 AW189404 AW067838 BE219870 AI424654 AI754980 R39239 AW183352 AA852425 AA488262 AI273011 AA488244 AA340752 AA449457 AA852555 F10855 W47214 R93301 F09300 AA853808 T28785 R38104 AI866639 F04302 AI872543 X56160 AL135631 W40199 T77595 AA219270 AA386039 AW608171 BE174080
103269	24390_3	AF230662 S79332 AB012575 X79200 N24445 N72228 H99655 AW291679 AA730715 AW975672 AI699644
102632	32834_1	U66618 NM_003077 BE244439 BE244967 BE242731 AW403224 BE273228 AL079523 AA580844 AI910318 AA121441 AW853822 AA355815 BE257890 BE254018 R54755 H72035 AA378378 AW846512 AW375588 AA402352 AW404560 AI133585 AF113019 AI174740 BE383453 AW375602 W69245 AA323991 AW369719 AI392720 BE076070 BE076246 AA252195 H54149 AW351946 AW371236 BE093129 AW317069 AI816724 BE463581 AI076940 AI123801 BE328399 AI870273 AA603776 AI039302 L31997 W69140 AI040190 BE301142 AI392962 AW189391 AW473894 AW082757 AA605026 AW168194 BE466942 AI222903 AA122012 AW275193 AA654229 AA847182 AI688771 F27116 AI871518 BE221378 AW439462 AW189556 AW193491 AI471650 AI799779 AW242172 AI580420 BE502872 AW452211 AA639503 AI368655 AW192152 AI651528 AI749109 AA761143 AA478436 AW452291 AA853485 AA810038 AI500025 AI363801 AI673822 AA252347 AI089964 BE241994 AA587708 H22237 H53989
126180	3791_1	L32977 NM_006003 AA158808 AA625124 BE268625 AA401287 AA411487 H93686 BE536275 AA232779 AA406405 BE265593 AA429929 BE293575 H95308 Z82206 BE388670 BE272057 AA216717 BE394775 T70795 AA304678 H78320 AA371448 AI684596 N89414 AI806645 AW883131 AI983340 AW855827 BE154049 AA094511 AA304354 AI806153 AI708422 AW604518 AI765817 AI735380 AW075958 AI963624 AI740521 AA096216 AI459163 AW339112 R00712 AI589173 AA602549 AI879981 AA887659 AI762362 AI937378 AA341466 AW517324 AW157415 AW675434 AA613727 AA576788 AI186410 AA837040 AA165456 AI460082 AA404279 AW004639 AI240300 AW183961 AA243348 AA906904 AA243703 AI275411 AI283440 AA406265 AW661954 AA947892 AI015132 AA977942 AA557310 AI206823 AI339554 AI241703 AI221435 AI199546 AI682610 AA325404 AI139132 AA831282 AI379291 H95258 AW628401 AW628396 AA917089 AA166949 AI635864 AI097345 AI356442 AI339672 AA713531 AI708674 AI460047 AI040539 AI537314 AA936513 AW162216 R58299 AI275038 AA788878 AA828417 AA594488 AA161091 AA772693 AA829967 AI302663 AA861569 AW731618 AW663554 W93673 AI800799 AI140258 AA035338 AW731639 N70360 AA805692 F28732 AI343921 AI289047 AA535684 AA410426 AA436339 AA253373 AA769244 AI122989 N77880 AA809270 AI289953 AI679447 AA426301 AW270437 AA909132 AI741407 T69809 AA884037 W79292 AI474297 N36119 AI832850 R50825 AA076134 AA503751 AA348907 AA709352 AI086497 AI338555 AA883067 AA922475 AA327126 F36722 AW302275 F26852 AI202816 AI363391 H79107 AA605247 AI183576 AI374603 AA862585 AW044276 AA844456 AI858659 AI168636 AI366750 AA135461 AI187796 AI521758 AI752729 AA448184 AW025454 AA622180 BE041579 AA128126 AW081491 AW662005 BE044407 AA835867 AW381493 F24322 F35020 AA922270 AA233263 F22315 AA829016 AA476810 AA171970 AA171733 T29549 D11847 AA348906 H78319 AA876617 AI572829 AW271537 AI284780 AW875817 R00713 BE156643 R00305 AI422469 AI473291 AA157975 AA094326 BE387637 BE541153 BE388199 BE387712 AA233272 AW051428 BE390716 BE378350 BE567621 BE385400 BE514640 AA411294 AA426300 AA524811 AA125817 AA847641 AA135167 AA581376 AA883191 AI277130 AA905986 BE410969 H79106 AI891117 AI690358 BE383378 AV655976 T99958 AW149479 AA165643 AI285299 AI933251 D51255 AA721196 AW604505 AA834904 BE394936 AA166936
102687	18766_1	NM_007019 U73379 AA403208 AA315182 BE295294 AL050348 W04406 BE618643 BE268039 AA401609 BE618097 BE559663 BE538158 R80990 AI554680 AI650374 AA305922 R95056 AW966695 AI417343 AI935139 AW005769 AI831252 AA554943 AI246563 AW274491 AW020646 AW080931 BE552307 AW472855 AI660049 AI380738 BE504728 AI808876 T86566 AA777748 AI270758 AI281284 BE550389 N88948 AI637467 AA564413 AI264541 AA705085 AI368831 AA403150 AA401483 AA700029 AA913021 AA705555 AI264545 AI097153 AA430504 AA913020 T86744 BE205766 N75989 AI308917 AW590111 AI799019 AA149943 AA629934 AW027600 AI867762 AI909396 AI909403 AA936828 R80790 AA136118 AI909375 AA977854 AA834364 AA974269 AW263663 AA596035 R94970 AW025749 AW188591 AA382274 AI565861 AW016092 AI590646 N89562 AI695116 AW807662 AA160710 AW079637
118336	179356_1	BE327311 AI808202 AA860831 AW150145 AI948907 AA987955 AI768241 AW340343 AI348657 BE501343 AW299642 AI093850 N63604 AI424600 AI142481 N50995 AI127277 AI383067 AA228931 AW205034 AI041317 AI801898 AA319620 R61165 N44200 AA405345
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125573	23881_16	AI351642 AI341707
117701	387299_1	BE063921 BE063942 AW601259 BE063918 BE063941 BE063926 AW601254 BE064015 BE063995 BE064010 BE064000 BE064004 BE064005 BE064012 BE063988 BE063994 BE063999 AW601276 BE063937 BE064006 AW601262 BE064018 AW601271 AW601265 AW601263 BE063914 BE063933 BE063922 BE063936 AW601261 AW601260 AW601269 BE063908 BE063931 AW601275 BE063919 BE063909 BE063913 AW601280 AW601257 AW104751 AA909650 AI636164 AI963605 AA634583 AI476578 N41029 AI970121 AI963918
118381	153985_-2	N64513
124955	128540_1	AA376768 AA121086 AA102312 AW958182 N44159 BE544375 AA102335 AI858272 AA587215 AW603852 AA135360 N36189 AI290208 AA122310 BE243078 AA216644 AW294925 AI279131 AA523335 AI718039 AI298302 AW675772 AW504461 AA573431 AA157727 AI719848 AA101293 AI420820 T08661 AI742968 W40578 W40576 T10598
124970	53587_1	BE272862 AA451722 AA342154 AW956503 BE001601 W46270 R20126 R18733 R20225 BE068802 R02858 AA093367 N84342 Z45122 AW404957 AA737370 AI268181 D62753 AA436923 BE612675 AW665329 AW276651 AI436023 AA421942 BE082522 AW513555 AA552450 AA902111 AI130683 AA677531 W46271 AI922610 R43184 AI379157 AA436254 R43056 R43316 AA928072 AW135588 AI277543 AA757018 AI290563 R01715 AI286006 AI817546 AI580766 AI809448 AI243390 AA737338 AA878528 BE549899 AA490379 AA677439 AI269156 AI625174 T23799 T32371 AI423766 AI202584 AI867625 AI568784 AA878057 AW801964 BE503376
134006	5164_1	Z45957 AA977019 AK001319 AW884800 T24618 AW935096 BE077052 BE077059 H30430 AA096374 AA974807 AA991272 AA478898 AA625224 AA487854 BE168198 BE173737 AA336798 AW966519 AW939272 BE168437 BE166482 AA234073 N42386 AI905477 AW062573

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134032	15436_1	NM_005025 Z81326 R12152 AI133613 AA164563 AA115876 F07041 AA136450 R14666 AI817265 AW903276 AI805394 AA365392 AW959995 AA364817 AA364755 AI742453 AA873052 AI207467 AA165401 AI469988 AA588349 AI797921 AA912147 AA933058 N47859 AI498633 AA773462 AA115877 H09572 AI084579 N59863 AI868483 AW149021 N53887 AW275941 AW275927 R42394 R15085 BE086602 H09005
110520	3910_3	N54069 AI079533 R97640 H83148 AW517093 AW978663 AI880842 AI659005 H83330 AI684258 AI927403 N35798 AI018674 AA427541 AA938757 AI190040 AI253077 AI744649 AA649064 AW337235 AI308803 AI742133 AW571802 H80392 AA598685 AI263770 AI583731 AI869001 AA609265 AI003434 AA868157 AA936793 AA993053 AW269187 AI290424 AI560859 AI865732 H89866 AI918981 AA609549 AW470626 H67986 F10742 R93584 AI474468 H52072 H86482 R97641 R39279 R96336 AI865468 AI984938 AA640457 H44970 AA029701 R62598 H81129 AA889367 H68025 R96337 H52073 H93374 AI278166 R44303 R37360 H83689 AI290552 BE082698 AW378331 AW378276 AW378300 R92197 AA427540 AA352703 AW953604 H56965 H45023 AA280523 AA029747 R62646 H82927 R23552 R13447 H91145 H68691 R93585 H81033 H80296 H67665 AA516480 H91195
103328	25750_1	AU077333 M81635 NM_004099 X60067 AI686183 AW401439 T39535 AA302410 AV645727 AV653397 AA317395 AA218582 AA219682 AA227317 AI750900 BE440055 H77491 F12371 AA314714 T74055 AI655647 AA489421 AA346569 AI129523 AA094975 AW793582 R97358 H67966 N72440 H79590 H81459 H60508 R39623 H60900 H40547 AA377244 AA318430 H71201 R64651 R65629 H72546 AW798947 N76974 H03029 N77701 AW151751 H60925 AA455839 H72947 N58334 N55487 AI299891 AA581634 AV651323 AV651728 AV650086 AV651295 AV648042 AW020600 AI537887 AA429713 AW080244 N73463 AA471335 AW150316 AA360851 W01407 BE074301 W21371 T87221 AA190691 D16906 AW862400 AV661466 AI357816 AA442743 AI189966 AW887793 BE005206 AI926016 AA317024 AA976151 AA247314 AI767184 R64644 R62817 D57965 N74437 N74385 H60409 N66059 H91165 R79462 F09991 R26175 H77853 N32590 D56667 AA461122 D56666 D56903 AW021856 AA374084 R69734 H66894 T81638 T63958 W23935 R67668 AW021682 H81249 H61959 H89852 R79306 W25710 W42964 AA384428 AW994316 H95163 H95158 R33688 W46557 AW748451 AA029916 AA463826 AA314287 R23084 AA368891 H02926 AA310456 H03632 C02397 R63745 H94539 R32226 R24648 H44502 AA039671 AA345336 W42846 R48024 R79724 R63143 AA379513 R21780 R80704 T70422 H21580 H46388 R62779 AA579734 N64111 AA344527 AI865473 R66666 Z20058 T52284 H95103 R36513 R21874 R31363 AA220939 BE439895 AI189683 AA164901 AI539383 AA768249 AA442361 W02867 AA303315 AW952009 AA314544 AI076799 AA216780 T70338 AA039672 AW629489 AL044620 AA533203 AA043082 AI668619 AW298204 AW195268 AI391606 AA437282 AW304801 AW085720 W02586 AA863279 T82339 AI356879 BE464557 AI038992 AI190018 BE146083 AI860399 AI039572 AI129687 AW468134 AI436074 AI963509 AI682239 AW663467 AW129557 AA680298 AA460262 H91217 N57879 R66069 N95684 AA040855 AA227116 N94486 H04229 H97877 AI161080 AI074367 AI025767 AI754185 AA888150 AI356979 R79463 AA029917 R69637 AI810134 AA460820 AI377990 AI743170 AA854637 AA628548 AA664223 AI362196 AA489363 AI361404 AI363155 AA300504 AI678269 AA633851 H61743 AI161012 AW339721 W42847 W46558 AA143120 AI042475 AA479365 AA219592 AW468142 H67690 AI186516 AA531387 AA835378 H03030 T68119 H95133 AL040491 AI289149 R63701 R32177 R32865 AI811374 AI613274 AA775300 AW192882 R37509 W42965 R47918 AI949525 AI129450 H49378 AI435907 AI832271 AA479271 R21849 H03633 AI888539 C75673 AI261394 AA614478 AW469307 AI281429 W03148 AW026141 AW236371 R79725 AA346568 C06197 T27764 H59538 AI749196 AA485299 AA719227 AI698762 N70790 AI925028 R21734 AA977432 H77905 AI625648 AA918868 AI220069 AI352568 AA668729 AA195395 T63334 AI932783 N32271 R26048 H90697 R24539 AI970287 T55374 N93019 T11162 AA377400 AW882126 AA602293 F35923 AI424237 AI826517 H27442 AA039729 AA382630 AI587304 AA045112 T57779 AI474576 AI352569 R63095 H44456 X85116 AI521609 AA164352 BE146079 H60082 AI334776 AA700506 AA782742 R67386 R22978 R33584 R67011 R80705 AI245311 H81590 AI360786 AI219244 R39564 H66850 AI184385 AA687691 H68013 AA092081 AI445480 AW005734
110561	4210_1	AA379597 NM_014176 AF161499 D60596 AW250547 AA263084 AF160215 AK000504 AI791736 BE619589 AA004600 AA046871 N56803 BE565759 AB032931 AW953735 N56775 AI056896 AI990409 AW376655 AA005074 AW376078 AI337884 AI200949 AI807795 AI023297 AA932357 AI733426 AW512478 N58077 AA910576 AW572795 N27384 AW055339 AW104443 AA904609 N30911 AA911567 AI146665 H13147 AI125234 H67713 AA046828 AA993476 AI377004 AI090522 AA922842 AA505790 AI140513 AI032574 AI355194 AA643701 AA004517 AW249886 AA938964 H59617 H75736 AA985450 N55023 N57685 N32135 AA972188 AI808881 AI672631 AI079135 AA807988 AA705231 N30598 H90512 AA368114 AA622435 AW067367 AW795927 AA864550 AA091926 BE075971 N41842 H13146 H58325 N77541 N64292 H90608 N77212 H64100 H59658 T96922 T97029 H58714 H75871
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102748	8256_1	BE018138 AW401820 U79528 NM_005866 BE261984 BE407845 BE277280 BE276415 BE275851 BE255885 BE389124 BE312265 BE019581 AA113935 AW368879 C03833 AA279740 BE156147 BE386063 BE386600 AA325860 AW751249 AA296282 AA309501 AL157561 BE258376 BE543357 R48762 R82601 AA135448 AW362528 H81355 AW610370 AW610351 AW957954 AA316259 AW821752 AW821763 AW610377 H58573 BE090207 BE090194 AW606620 AW369343 AW606618 AW363461 R98293 AW374376 AI127995 AI963393 N64225 AA814893 AA156740 AW572566 AW875498 AW608771 AA483617 AA468678 AA845936 AF001977 U75283 AA778401 R94700 AI148384 AI420667 AI808225 AW081100 R67369 AW886677 AW575026 AI591069 AI085323 W47485 R48763 AI936775 AI130869 AW298687 R32351 AA279822 AA767925 BE617533 AW610380 BE261711 AI073481 N58028 AI951949 H58236 AI801362 N31589 AW872950 AA770251 R98053 AA702945 AI803313 W60341 AW473964 H41154 AI927157 AA477980 AI956026 AW771816 AA902628 AA400729 AI686538 BE384763 AA113934 AA987872 AW516129 AA890660 BE548441 AA513291 BE388837 BE386319 W47484 N42600 BE408636 AW196854 AA709430 H81301 R31621 AI718978 AI244069 AW083904 AW615581 BE620020 BE388637 AA636067 AA477979 AW732407
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102772	25764_1	U83115 AI065078 AI064965 R78834 AA251227 N98971 AW960425 AI765826 AW272757 AI522011 AA577197 N69832 AI796512 H78699 AA694054 AA251228 AA558167 AI337422 R79329 AI860519 AI800499 AW015732 AA593383 H89714 H12321 H40510 R83261 T53644

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132883	4446_1	AA373314 BE042692 AW135187 AW751673 T30808 T17147 F07527 Z43038 AL110207 N56008 AA295809 AA303946 AA187908 H02145 R82250 R21174 T05429 AA149312 H91287 H47312 T59791 AA327743 AW959920 AA047151 AA042929 W79323 N28243 AW361453 T59658 AI633886 AI825845 AI672514 AI669657 AI917587 AI761837 BE466305 AA042976 AA149242 AW002943 AW662406 AI434624 W79423 AI025949 AI202452 AI635059 H90378 AI373910 AI860143 AI242990 AA972170 H02146 AW237289 AA702239 AA047290 T17146 AI433847 AI086755 AI074424 AI638095 AW303858 AA703636 H62439 AA971818 AA639538 H62425 AI244773 AW104880 AW016719 N23623 R06163 AA961232 AA974465 AI335830 AI991454 AW592598 AW242938 AI611017 AI810716 AW869345 H67615 AI025948 AI420535 AI799741 F34993 AI499542 BE504982 H47393 AI873145 AA918462 R45954 H67078 R06063 H61439 H58198 H61425 R26497 R33068
134109	58458_1	AA348031 N36289 AA029108 N44785 W32887 AA085513 H99671 N35592 AW025225 N34379 AA908705 H13386 R13339 W02669 W03164 AA938405 D81339 AA197086 AA348647 W03410 AV647005 AA757887 W73230 W73285 AI809089 AA527333 AI096643 AA861288 AA993061 AL119078 N74451 N74398 AA736438 N35475 AW271207 AA782011 AA630851 AI359176 AA911761 N67481 AA470841 W81567 N24828 AA776157 AI220315 AA719560 W35156 AI911196 AA693790 AI023064 AA700944 AA029998 T32810 AA903660 AA991934 AA197014 AI313007 AI244576 AA701095 T32824 N28424 AI620318 AA610082 AI245085 H06050 N42841 Z19860 Z21076 F16768
134133	28210_1	AA262294 AU076991 D31396 AI750772 AA159076 BE274766 F12663 R59864 R14494 AA393859 BE242904 AB013382 AB013601 X93920 NM_001946 BE302698 BE277522 AA376048 R56303 AW963843 BE303045 AV647942 AA313210 AV645708 AV658608 AV657088 AV656645 AV658779 AA314475 Z44559 R59865 AA304855 AW991466 F10276 R06817 R10611 W03980 T80992 R10613 BE163098 F05427 F05303 T91929 W72835 AA298800 AW389635 AA308036 AA127907 AW389663 AW894164 F12020 T65624 BE175780 H16652 H24811 T59778 BE166275 AA132053 AW290904 AW467431 AI949528 AA120788 AI185315 AI707683 AW020919 AI192556 BE220784 AI342571 BE221591 AW572844 R56221 AA828935 N73917 AW339578 AW613310 T16061 T17184 AW470946 T80993 BE350535 AW088518 BE250462 AA971609 AI085452 D30852 AI418975 AI092872 AI750773 AA779887 AI472189 AI590360 AI913771 AI418318 AA677348 AA857239 AW820356 AA630374 AI570772 AA148198 AA405450 H24635 R06765 AA699326 D45590 AA159077 AW467788 AA776489 T58899 AA639297 AA618367 BE242383 AI814368 Z38329 AW078669 AI925363 AA535062 AA811335 AI361925 AW276471 AI573117 T91845 AW188984 AW885754 AI860504 AI619683 AI491918 BE349335 AI914906 W72836 BE003237 AA610305 AA768101 H16509 AA973395 AA132157 AW304113 AA976980 AA565289 BE207526 AA455254 AA902518 AA856930 AA344776 AI433775 AA446563 AI245402 AI470568 AI167965 AA367742 F09667 AI251112 AA919150 AA302216 AA535575 AI470424 F01686 AI282775 BE349349 AW293481 R82605 T85557 F03628 T25188 AA446688
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134142	15992_1	BE244053 AL040314 BE241629 X76061 AL041167 S67171 X74594 NM_005611 AW505566 BE177705 N48402 AW501958 AA095064 N88851 AA093523 AA311592 T16946 R21714 AA181463 H20728 AI240076 AA885217 AA179202 R12761 T29803 N38772 AV661617 AV661887 AI656871 AI680908 AW272833 AA744758 AI807601 AI620692 AI459215 AI333590 AI288993 AI337125 H20729 AA992582 AW241773 R46603 AW772098 AA480678 T16945 AI248936 AI298980 R39808 BE046413 AW502872 AA179192 AA663452 AI753480 AA187067 AA181635 AI754024 AI908250 AI908248 AA460533 AA447057 BE327763 BE327782 AA169617 W24290 BE242332 AW393483 AI910552 BE241508 N42562 AW385629 AW369787 N88431 T75197 AA531494 BE067591 C75198 BE002796 AA160257 AA159758 AL121384 N42147 T07364 AW604888 BE222226 AW610203 BE467093 AI971222 Z24868 W58597 AA034331 AA436730 W58596 N48125 AI201018 N33141 AW516655 Z28612 AA194620 AW303366 AL040073 AW090583 AI651085 AI963161 N31833 AI950136 AI829403 AI838618 BE221314 AA829754 AI040434 AI025340 N38978 AW235932 AA883913 AI418390 AW264746 D57931 AW512616 AI784550 AI559210 AI354322 BE244924 AW518374 AI193259 AW510412 AA460534 AI005669 R43670 AA927423 AA443670 BE245929 AA181203 AA159757 AI624870 AI918422 D58085 AI690381 AI422510 D58004 N50554 D58363 D57416 D56555 AW118278 AA160256 AA678664 F10323 BE087727
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133516	25965_8	BE265133 D82119 D82548 D82108 BE564452 BE271655 AA159250 AA307115 AW957778 AW957855 BE384770 BE564845 BE613759 BE616283 AA094977 AA090726 BE566205 AI541458 AI905511 BE564334 BE383761 BE543830 BE273482 BE615743 BE277277 BE563390 BE616415 M62898 NM_004039 BE566729 D00017 AW605881 BE262465 Z36789 BE568740 AI541156 BE568537 BE386719 BE621386 M62895 BE569171 BE620550 BE568625 BE564775 AW951474 BE567052 BE564585 BE564335 AA158887 M62896 AA186653 BE569005 BE566752 BE564436 BE568344 AA173037 AA186910 BE615393 BE541140 BE548907 BE385094 BE514560 BE315185 BE615967 BE278660 BE383700 BE386439 BE250047 BE539994 BE249987 BE384668 BE277814 BE541353 BE385626 BE617290 BE265643 BE546769 BE311739 BE408847 BE396400 BE312222 BE540873 BE295024 AA375199 H95312 BE390537 BE315471 AW816692 AA314335 AA370376 BE298921 AW993089 AA304141 AA304371 BE180854 BE379733 AW753635 R79521 BE617783 AA366447 BE569009 AI540902 BE548060 AW838418 BE537832 AI540892 BE621077 BE621678 BE615346 AA652355 BE541787 AA095619 R93371 BE566399 BE293391 AA186441 AA156222 AA155921 AA082679 AA155886 AW383882 BE548278 AI583383 AA176317 BE621909 BE175024 BE379669 T63382 AW838243 T62504 R57147 AW373022 BE180961 AA522706 H58991 BE614628 H41944 T65688 AA075544 AW376033 AW998934 AA071421 AI560134 AA165688 BE393276 H21852 R53923 AA069900 AW391356 H42698 AA186424 AW970677 AW606532 AA890059 AW970552 AI559253 AI984166 H41905 T47539 AI571618 AI540879 AI569320 AI979120 T94131 R69596 AA983300 AW974825 R76210 AA989667 H03427 AA975584 AA151828 H21653 AI582510 AA181033 AA865378 W68332 AW803324 H54786 AI469278 BE149517 AA524331 R35867 AA857151 AI589316 R31675 AW839933 AI284470 AA641473 R37520 AI282236 H58944 AI934113 AA191242 T65704 AA861193 AW196128 AA191415 AI698976 AW087150 AW391335 AI491997 AI654288 AA654567 W46513 AA160136 AA570680 AA187787 AA301838 AA128660 H72633 R33225 N59561 AW373026 AA157247 AI472515 AI554440 AI754953 AW373014 AA160337 AW362293 W46445 AA725273 AA302349 AI583039 AA661718 BE150340 AA243223 AI916458 AA312977
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		T34515 AA173847 BE560244 AL079696 T34244 BE389128 T34110 AW249130 BE266743 T04892 BE264706 BE264738 AW403234 AW401535 AA456984 BE207185 AW247060 AW998463 AA121373 AW994780 AA126661 AW407083 AW379415 AW578239 BE018419 AA366688 AA608513 BE378292 BE378337 AW103935 BE397789 AA302580 AI690498 AI697283 AA403211 N85842 AA463406 AW006584 AI589068 AA780276 AI871938 AA626835 AW439624 AW272829 AW512621 AI183842 AI591229 AW337254 AW410814 AA608753 AW009146 AA303726 AA456910 AI627190 AA877724 AW337702 BE302029 AI265957 AA775202 AW248698 AW245062 AW250412 AA173796 AI554428 AI244134 AA976264 AW086156 AA587634 AA425288 AA121363 AI377104 T58642 AA812669 AA812844 AI142489 AW074600 AI149028 AI588887 AW249803 AA425377 AA548184 AI919273 AI363195 AI344708 W76340 AI818834 AA622965 AI568201 AA101545 N52934 AI049533 AA609990 H10061 AI866342 AW182709 AA864718 AW248899 AA805143 AI289603 AW103872 AA171533 BE246291 AA460465 AA772204 BE243011 AA961876 AI382421 AI374630 AA604245 AI927540 AW136766 AA857850 BE327421 AW248810 AI869885 BE075382 AW408520 AA126563 AI471177 AW873754 AI280817 AI810212 AL039534 AL043443 AL046346 BE311964 BE408579 BE264809 BE266189 AA878026 AW965697 BE300560 BE294790
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133579	13380_2	X75346 AW651720 AW389703 AI015618 BE280175 AA918165 W58725 BE294557 AI024833 BE176376 AI248432 AA171560 W69432 AA400549 AA355384 AW579403 AA815466 AI025585
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102846	4725_1	BE264974 AW245788 BE313711 BE336907 AA972912 U96131 AI358369 AI813492 AW292892 AW341586 AA806168 AA521372 BE315517 BE268193 AA630784 T74142 AA292903 AI141851 AI122551 AA114129 AI183966 AA461026 R94450 AI183968 AA668813 AA401737 BE090548 AA504581 AA134541 AA251208 AW967466 AW161726 AI890569 AI018417 AW162098 AA114284 AW245430 AA716100 BE349100 AW007741 AI885478 AA035686 AA456703 AI590851 AI126434 AI745513 AI572647 R84564 AW161707 W87693 AA456305 AI274246 AA251127 AA063557 AA129647 AA504500 AA524578 AI473676 AI222896 AI222899 T16428 R12705 AA005213 AW591056 F10153 AI383949 AA460677 R94449
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		AA804318 AW518376 AW385913 AW083674 AI434034 AA938397 AI568283 AI249444 AA429884 AI719349 AW242259 AA429853 AW083900 AI738855 AI918581 H52597 R96654 AA341390 AA293559 AI680255 AI356472 AI472682 AA676709 AI718177 AA164192 AI339296 AW797221 AW511915 AI589416 AA953338 AI500000 AA876313 AI620034 AI865454 AA659294 AW474126 AW518454 AI719715 AW591921 AW379873 AI224057 AW302596 AI540725 AI499983 AI865593 AA728993 AI982586 AI865084 AA635760 AA946758 AW103642 AA742526 AA343052 AW474659 AI468868 H82407 AA485278 AW518420 AI468940 AW801881 AI497706 AW798431 AW802047 AI865054 AW806331 AI865359 AI468879 AW575637 AA463953 AA974229 AA634007 AI500079 AW132051 AI566981 AW518558 AI344428 AI865335 AA341031 AI864785 AA340691 AW377744 AA888268 AW084380 AW798443 AI250368 AI311592 AA884560 AA876296 BE043978 R47979 AW132040 AW194504 AW131929 AW868536 AA659167 H78841 AW868510 AW868566 AW795288 AI500092 AW868513 AW795236 AI702370 AA931740 AW150418 D57484 AW571419 AA340651 N69295 BE041339 AI699286 AW338685 AA283456 H52117 AA746160 F01419 AI865055 AI660260 AI920895 AI718157 T63514 AW627467 AA865201 AW190214 AI735415 AW768581 BE241961 AI758965 AW264843 AI828746 AI478245
132959	93073_1	AW014195 AW236028 AI652095 AI927228 AI380704 AI824939 AI949156 AI916799 AI823483 AA977296 AI478932 AI767924 AI878836 AW001812 AI335537 AA028103 BE466764 AA501553 AW611647 AI470601 AI760094 AA636041 AI436769 AI359669 AI279500 AA625548 AI879396 F35913 AA307748 AA028124 AI419586
132967	11897_1	AA316181 BE439545 AC005053 AF186249 AW386101 AC004969 AA730199 AA032221 AI686139 AI167942 AA809228 AI184070 AI394674 AW969977 AA032279 AW079284 AA513174 AA888312 AI453179 AA483363 AA528432 AA579511
117921	9346_1	AA021459 AL157453 N48694 AW898879 H08850 N46609 AW014561 N51002 AA482856 AA482842 AA482868 AA885753 AI628670
117929	354923_1	N51075 AA570794 AA568306 N51518 N51117 AA708939
104189	36097_1	AB040927 AW503387 AA044786 AI686957 AW157364 AW976667 AI752687 AA191323 AA568170 AI161414 R17699 AI140787 AI140789 AI140788 AA742642 AA044809 AA485805 AA847859 AA480178 Z45709 AW974554 BE043079 AA809758 AA648838 N46563 AA485676 AW304745 AV657192 AI553650 AW118847 AI871278 BE075093 AI243817 BE046860 AI560949 AI669278 AA860508 N39152 AW131465 AA767854 AI457964 AA906227 AA719622 Z41372 T93491 AA954262 BE537985 T96329
133626	13594_1	AW836130 AW835974 AL050139 N55404 N50647 H65865 AI144372 AI017049 AA705406 AI307184 AI022705 AI968431 AI085083 AA626205 AA425498 AI742520 AA741124 AI142763 AA907209 AW172328 AA287645 N49379 AA953874 W16717 AA301311 AW954269 AA197034 N55846 BE090804 R53137 Z44364 F13150 R20711 T75455 R14200 H20627 R25071 N49469 AA286797 AW008192 AA703511 H70281 Z45243 AA773797 AA773413 BE003771 AA194861 R08091 T82191 AW992244 R36356 AA214332 H70005 R99487 R30887 AA281025 AI608650 AW272887 AA196596 R91025 AI951974 AI832818 BE539680 W37344 H26029 AW609768 AW372093 H88114 W20231 AA022846 AA699455 AA732984 R35984 R45410 F19000 AA425222 AW502919 AI805635 AW150239 N52927 AA196999 R53051 C16460 W37345 AA196597 H20534 AA214291 N33356 AA922316 BE302395 N79536 AA211465 T17038 R37483 AA704178 AA280828 AA680417 AI022452 R30818 AA927124 H69548 H75939 Z40299 F04137 AW089314 BE538997 N90592 R99488 AA501818 AA501883 R98376 H88115 R39229 AA022735 R88766 F10753
103546	14163_1	Z14244 NM_001866 AW293449 AA373029 AI209213 AW023613 AA629999 C05067 BE185552 AI633443 F31015 D54638 AA362610 W93971 AI057576 AI435557 AA328050 AW327525 AA380084 F26749 AI269382 D55420 C05812 AA729559 AA854074 AW327577 AA362524 AA501364 F25447 F30058 F30458 F32332 AW950628 AV656809 AA374630 F30443 F30670 AI750060 AI041671 F19421 N55333 F35876 AW005526 AI189185 F36277 AI250898 AI031955 AI278272 AI417083 F22157 AI027095 AI806069 AA351962 AI246785 F22562 AI721231 AA354796 AI832784 AI080588 AI139984 AW391514 AA938681 F34040 AI799736 F20642 AA450071 AI041395 F25781 F31026 F26799 F29253 AF042164 AA770218 AA704607 AA447584 BE466635 AI708614 C17594 AA385685 F27273 AI880366 AI832710 T29546 AA715342 F33426 AA664822 F35584 AI097193 F16349 AI688436 AA725197 AA335860 F17677 AA336167 AA974878 F34245 F35499 AA363970 AW779910 AW265335 N29683 AA482887 N86053 AW449724 AA448083 N40786 N56699 AA136905 AA559990 AA086263 H62149 AA004253 N77338 AA452719 AA256349 W56125 H49485 AA658922 N56693 AA132296 AI832633 AA128449 AI749836 AA564094 F33633 AI719308 BE047545 AA004674 C17693 N87723 T54528 T54567 N86261 AI129001 AA654738 AA916211 AA908340 AA876815 AA132212 AA855135 AA737883 W93972 AA506139 AA846271 AA702006 AA715260 AA908337 N40794 R28778 AA096165 AA355108 AW844162 AA860091 AA993050 AA733059 AA136876 C04413 C05425 AA091340
103554	13065_1	AI878826 AI929158 N31103 AA347183 AA248217 AW961707 N87005 C17652 AA369211 Z18951 H66802 NM_001753 AA328468 AA088613 R68436 N39694 H01840 AA032028 AA047106 AA093459 N83187 C18904 AA159249 AA055368 AA373326 R30895 R28121 N48403 C04762 C16932 C03435 AI335280 C05249 AA188337 BE502929 BE504257 AW612216 AI214662 AW103859 H02347 R83227 BE348483 AI609212 AA715541 AA082794 AI879387 AA031927 AI130038 AI352534 AW242202 R57424 BE220867 AI336460 AI936424 AW090694 AI278810 T29057 AW972291 BE440165 AA810380 AI986274 AA935254 AA568957 AI359149 AA919163 N26590 H39849 AI372934 AI093262 AI075302 AI288547 H97367 AI193751 AI304816 N38775 N33790 AA159152 N66822 N26607 N21174 AA972833 AI268920 AA483005 AA047243 AI752222 AA639275 N34192 AW972286 R83228 AA513168 AA736916 AA484741 N86668 AA516059 AA736624 AW573564 AW573565 R30850 H24902 AI124038 AA487841 H02249 H21816 N72018 D58100 AA055835 W95609 N21091 W80871 BE173251 R60642 AA076608 D59158 C18549 H25070 AA502449 AA502557 W95608 AI561190 AA648092 AA516043 AA648083 R28011 AA483471
103556	10005_1	Z19002 NM_006006 F00118 AA428940 AA296151 AW960240 AW954317 AI937150 AA845269 F35964 AI198303 F36156 AI832425 AA296152 Z19413 AA614232 AA642184 AA468119
133666	3657_4	U56725 AL044372 BE259102 R30669 AA470119 L26336 AL046354 F07578 AL044984 AL039371 AL041486 R16445 AA348532 AW949548 AA495899 AL044373 AW243287 AI937198 AI796545 AI927985 AL041487 AI138624 AI923726 AI424368 AI720471 AI422082 AW890976 AW795342 BE349077 AA186792 AI205684 AW452365 AA626358 AA593734 AA128358 AA425007 AI631354 AI580818 AA426338 R12701 T24102 AW195491 AA469947 AW195225 AI081532 AI862189 F03817 AI478136 T28755 AA644433 AL040890 AL040891 AI567406 AA455102
102938	31360_4	W27518 W28655 W28159 BE396144 BE314414 BE563881 AU077239 BE387326 AW246409 NM_002300 X13794 N87540 BE409589 AA094603 BE561785 BE379931 BE379847 BE560681 BE279936 BE539753 BE612385 AA075862 BE540692 BE540512 BE407898 BE314552 BE563751 BE385102 BE384918 BE388054 BE543067 BE271640 BE409074 BE278029 AA079712 BE515315 BE614966 AA167755 BE278078 BE390807 BE256727 BE278776 BE255634 BE384282 BE540166 BE382485 BE313298 BE395565 BE539775 BE383247 BE394835 BE394810 BE256034 W25756 BE613058 BE379778 AI907279 R09283 AA148289 BE255657 BE379045 AI540576 AI214096 W26070 AA047609 AA746661 F00798 AI275737
133688	5059_1	U71321 NM_004117 AW500704 AA382675 U42031 N89070 AW590202 AA096449 AW852097 AW501471 AL039381 X97300 F00724 AA345703 AW963258 AL046274 AL045832 AA343895 AI088938 AW963084 AI631283 AA215901 D31377 D30980 D31048 Z28555 AL122066 AL042080 T32481 AI858005 AA294869 AA331701 AI366055 AA360668 AA055614 AA366258 AA366751 R01287 W87312 AA337314 AA385665 AW965077 R72262 D80933 AA370514 AW953859 AW957227 AW957225 AW954027 AA361257 AA343512 R45763 AA449044 AL046951 R45888 H53905 AI791369 AW889729 AA682530 AA345306 AA460554 W86302 W86653 AA705036 AI248463 AA694353 AA678103 AA932445 R01175 R72263 AI033456 AA976417 AA678744 N98804 AA872768 AL039382 AI700793 AI700784 AI220884 AL042081 T93673 BE218475 T25877 AA149239 AA814647 AA492261 AA058961 AA058962 AI679222 AL046952 AI140732 N59657 AI090508 AI096484 AA653318 AA769298 AA833776 AA789188 H53584 AW182642 AW771369 AI914759 AI283811 AA393250 AW337761 AA180323 N57686 AW264434 AI982716 AA873458 AW338312 AW518896 AI023192 AA804811 AI749139 AI130821 AW241260 AA612811 AI250235 AI168023 D60564 AA604012 AA868902 AI367342 N63715 AI055853 AA460555 AA631804 AA435612 AA767954 AA449758 AI351788 AI473448 AA596073 AA854081 AW079219 AA876551 AA617927 AI352199 AW976940 AW105227 AA989268 AA813062 AA370513 AI620591
125819	33253_15	AA044840 AA044815
119267	110609_1	AA064970 BE503073 N67391 AW590678 AA985587 T16327 T31477
126487	29209_25	AA283809 AA482656 AA482505
102962	3947_2	R50032 BE272542 BE273850 AI207796 AA449892 T52072 H80951 AA478186 AI752477 AI002190 AI678075 W32734 AI084634 AW340003 AL048379 BE049470 AA055941 AI097665 AW190504 AI220113 AI925471 AI921276 AI954135 AI889263 AI422681 AW338076 AA460424 AI262481 AW471355 AI888330 AI955667 AI192464 AW173487 AL041495 AA037436 AA085884 AW081135 AW083505 AW338916 AI628329 AW173532 AI865753 BE068259 AW058253 AW337211 AI925277 AW069174 AA777033 AI983508 AA522923 AW007447 AA928714 AI955927 AI912869 AI752381 AW069151 AW262741 AI419543 AI262262 AA905138 AA617845 AA603114 AA603119 AI982865 AW950575 AI985905

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102968	24693_1	AU076611 BE243124 AA343955 AA102186 AA307928 AA227387 AA314740 N86980 X16396 NM_006636 BE544371 AA361582 AA353457 AA172125 AA362045 BE545634 AW935573 AW368435 BE569039 N83453 AA354875 AW504993 W31001 AA281820 AW365599 AW365610 AW365606 BE542972 AI871407 AA480994 AA406118 AW387154 AI638274 C16082 AA210794 AW073141 AW365614 AI393287 AA282659 AI423141 AW365598 AW241512 BE466661 AI037877 AW591887 AW188655 AI683945 AA480995 AW385577 BE090663 AA171977 AI762124 AW875574 AI423138 AW951169 AW134804 AI263972 N98720 AA137110 AI439485 AW608789 AA551270 AA362384 AI739051 AA362456 AI917450 AI990317 AW205913 AA136984 BE503354 AI497794 AI003085 AI421923 AI458196 AI623243 AI672568 AI885912 AI351770 AW105422 AI588936 AW074512 BE467565 H99810 AI361330 AI127546 AA744500 N33204 AI268109 BE466041 AI568274 AA604783 AA865276 AW264668 AW473635 AA555020 AA410386 AA827245 AI337076 AA831189 AW272618 AI027573 AA312452 N35312 AW132154 AA404966 AA743094 AA759005 AA962299 AW769670 AI633795 AI867952 AA868173 T29190 AA814513 AW795635 BE243300 H60660 AA336544 BE537606 N44740 N44684 AA307129 AA312596
102976	14633_1	AU077174 BE616323 W25010 AL110099 NM_004390 X16832 AA305392 AW391441 R35036 AA309061 AA360805 AW815440 AW815685 BE171565 F06637 R18814 R64213 R68725 X07549 W78193 AA336414 Y18461 AW581172 AA054490 W95582 AA487325 AA487346 AA279600 H96491 AW969271 AA345648 W68555 AA992941 BE563114 AW976109 AI096690 AI122617 AI749481 AW026323 H69902 AI886820 T62554 AA283118 AI198774 N95617 W00965 AA593005 BE222876 T63395 AI004598 T91528 AI582812 AI126013 AI937274 AI031991 AI312045 AA844465 AA743166 AI872897 AA677296 W94703 AI380769 AA843780 AA908172 AA954631 AA864193 AA810948 AI189126 AI348197 AA844566 AI348198 AI299069 AA487231 AA996357 R43924 AA975404 AI138666 R49416 AI809565 AI090030 AA282919 T91499 AI057198 AI932538 AI078631 AI089500 AA973763 AI342332 R68673 W94575 AI363106 AA826054 AA760624 AA514570 AA682652 AI915535 AI224395 AI144333 AI362094 AI985969 AI436458 AA977082 AI335950 AI869230 AW572267 N70240 AA936650 AA827009 AI819708 N62614 W68211 T63952 N89602 AA918662 AI375214 T60000 AA873140 W95475 H73602 AA470367 AA775340 AA507672 BE139205 BE349596 AA903018 BE350901 AI827327 AI281432 AA548385 AI963342 AI985929 AA630102 AI955620 AI744996 AA487172 AA838328 AA658289 AI362589 AA872881 AA470832 AA659748 AA058337 AW512820 AA644662 AA502165 AI720562 AA865348 AA621446 AI267923 T59931 AA864686 AA582752 AA782286 AA768026 AW021729 R49423 AA622952 AA627103 AA913103 AI565188 AI869711 AI335624 AI363105 F02909 AI123813 AI919432 AI560364 AW591804 BE243287 T63540 AW518413 AI142065 T29691 AW963949 C02398 W70329 AI951124 AA747317 AI205593 AA947141 R64116 H73830 AA587498 AA532564 AW815511 AW815773 AW815836 AW815686 AW815435 AW815441 AW815439 AW815826 AW815760 AW815442 AW609595 AW815628 AW391443 AW815775 AW815825 BE254396 R35029 AW946116 T63330 AA886716 AI355072 AI378131 AA812294
102992	24839_13	M85430 AU076495 R06237 AW604847 AL162086 AA100051 AA158333 R01021 W87566 AA125842 AW503043 H30655 NM_003379 X51521 AA300214 BE293620 BE250025 AW505317 W61195 AA226978 D58824 AW499841 AW163414 AA251998 AI816093 AA152399 BE312481 J05021 BE535236 AA305199 AW407614 AW408681 N77970 AA312609 BE001280 AA877541 BE536355 AI269050 AL048877 BE064504 W39373 AI272023 AI033950 W87471 AW844221 N58381 AA777630 AA069221 AA069234 AW105693 BE174670 AW387283 AW387279 AA772163 AI076246 AA368689 AI247220 AA643529 AI240585 AI870488 AI075769 AA125857 W61147 R06238 H30656 AA159412 H30218 R01022 AA074396 AA355706 BE271450 AW157537 AI830027 AI816134 AI825881 AI688335 AI214071 AW176662 AW732611 BE562933 AI869702 AW997321 BE149700 AW821680 AA627389 AW856162 AW840172 AW856160 AW856164 AW856053 AW840205 AW582458 AW856165 AA340614 AW452775 AW382070 AI032419 BE272692 AW816677 AW816678 BE271792 AA576444 H67217 BE177808 AW816622 AI400391 BE149697 AA594450 AW935536 AW376579 AW364201 AW362605 AW364193 AW848501 AW376626 AW947474 AW376794 AW250260 AW376808 AW376722 AW376787 AA359700 AW848535 AW376771 BE143111 AW848737 AW848747 AW848873 AW376652 AW848530 AW849127 AW848451 AW848531 AW848609 AW848543 AW376670 AW848194 AW848682 AW848669 AW848541 AW848601 AW848394 AW376710 AW848532 AW849125 AW376723 AW376835 AW848605 AW376535 AW848664 AW848684 AW848944 AW848685 AW849095 AW848671 AW376602 AW578344 AW848941 AW376648 AW848198 AW376608 AW848200 AW376589 AW848554 AW848879 AW848323 AW578331 AW848330 AW848319 AW578377 AW849068 AW376793 AW376669 AW578352 AW849126 AW376727 AW848594 AW848251 AW848241 AW578343 AW848434 AW578332 AW849019 AW848889 AW752678 AW376574 AW848545 AW376591 AW578335 AW848466 AW376766 AW376664 AW848529 AW578330 AW578338 AW848524 AW848617 AW376790 AW376634 AW376725 AW376763 AW752659 AW376797 AW376755 AW376673 AW578350 AW848258 AW376760 AW376603 AW848446 AW849139 AW848611 AW376761 AW376611 AW848887 AW376628 AW376716 AW848647 AW376703 AW376714 AW376594 AW376596 AW848457 AW376572 AW848190 AW848606 AW376586 AW848462 AW376742 AW376677 AW376598 AW376746 AW848610 AW848447 AW848683 AW376556 AW856261 AW376638 AW367077 AA068995 AW068772 AL120506 AL120386 AI244494 BE545234 AA159304 AW376599 BE295933 AF187552 AA152400 BE543706 AW578337 AF188896 AA811996 AF189213 AF188897 AW856185 AF190059 BE070163 AA251742 AI750309 BE150151 BE150252 AW848663 BE150159 AW856128 BE150201 AW578313 BE150250 AW381440 AW856074 AW381435 BE150190 AW856179 AW856121 AW856174 AW401844 BE003225 AW856177 AA526169 AA640192 BE314916 AA779712 AI906402 BE537879 AI834242 AI909763 AW845219 AW845215 AI809671 AW997331 AW177044 AW862068 AW993854 BE301919 AI834227 AA071495 AA130320 AW796591 BE179055 BE179234 BE006022 BE171097 BE207582 C17290 D58666 BE541097 BE089932 AW842190 C16922 AW444560 AI909741 AW403131 AW845207 AA092681 F05915 AI909742 AA233232 F08318 AA305354 AA147149 AA356962 AW366642 R14107 BE140572 BE140576 AW390347 AW402485 AA670344 AW408599 AW402702 AW249495 AA376813 AW130853 BE536618 AW338652 AA361509 AA431551 AI758329 AA233156 AW369273 BE185308 AI264242 AA724592 AA159922 AW205121 AI206517 AA305432 AI369749 AW754278 R55893 R34799 F11143 AI198270 AA335689 AW439092 AA577609 AW894217 AI302960 AW406637 C17923 H63348 AI634226 BE177956 AI498384 AW609479 AW950912 BE085869 AW391004 R14402 AI669187 AI758210 AW150328 AW402978 AW474568 AW579293 AW363558 AW369322 AA633069 AW364214 AA557144 AA352699 AW369361 AI625770 AA037067 AW369367 AW369378 AW369383 AW369320 AW369340 AW369334 AW747900 AI452805 AA025994 AW969302 AI471469 AW838332 AA700483 AW575707 AW363552 AW754279 AI538596 N41444 AW369369 AA533573 AI697373 N91447 T63645 AA343413 AW369372 AA329807 AA847286 AW369363 AA009432

		BE177210 H43742 AA130321 H05246 AW517890 AW511678 AW198136 AA411576 AW934870 AW131725 N99045 AW190050 W48791 R96149 AW298454 AW051778 AI423040 AA147092 AW438903 AW519147 AI936035 AW747910 AI588900 AI572603 AA854132 AW272152 AI884403 AI689595 AA994684 AA576990 AW837159 AA411440 Z20745 AW369342 AI554272 AW051768 AA865624 AW190197 AW129438 AI590389 AI954048 AI553828 AI000547 AI858437 AA554141 AI017045 U82777 AA431097 AA622202 AA101026 AA890524 AI141907 AA770195 BE000706 AI338886 D20039 BE001103 BE000729 AI093763 AI128438 AI038158 AI014806 AI206804 AI128741 AA731344 AA781650 AA847245 AW977294 AI149018 AA725251 AI073592 AA601940 AA687609 AW001981 AA857855 AA027254 AI696346 AW068510 AA025935 AI288581 AA312064 AI366687 AI123208 AI361102 AA009433 AI375745 AI190304 AI810395 AI061262 AA722843 AA027255 AA693398 AA983511 AI523184 R55808 AI766707 AA723485 AA158005 AA731346 AI860056 AA470452 AI344375 AI052053 AA706704 W49616 W81209 AW058630 W38348 AA648692 AI244933 AA233115 AW803105 N69871 AI357292 W81226 AA676328 AA977264 N69416 AW082751 AI354629 AA843429 AI701333 AA161092 AA226840 AA993389 AW176551 AA243693 AA937997 AA470742 R96150 AA873311 AA282110 AI245104 AA318159 AI648622 T63845 AA972595 AW573031 H63268 C75028 AA523040 F02163 AI221319 F04541 AA708486 F08814 AA550863 AA524127 T28847 AI868107 AA635688 AA282111 AI147151
102993	17554_1	BE262998 BE245856 BE244814 BE243904 AU077244 AW410227 BE263251 BE313253 BE268009 AA314290 AW407890 AA482209 AA315209 NM_001237 X51688 AA158802 X68303 AA360411 AA001329 AW608728 AI061440 AW875571 AI654232 AW371180 AA608568 AW371208 AA213393 AA306347 AI872410 AA936671 AI763348 AI948484 N41638 AA482297 AI827243 AW276578 AI199011 AI350965 AA158803 AI040688 AA693660 T28292 AW950496 AA001916 AA213394 AA557629 AI872826 BE564910 AA580754 AA459213 AA213538
112033	259080_1	R49031 AI620424 R43162 R37467 H90387 AA367338 AW955845
112068	611385_1	AI264847 R43910 AW614197 AI863821 AW467620 AI695292 AI672346 AI302090 N81071 AI611641 AW166600 AI168293 AI313201 R43835
104204	11607_1	AK001691 R80991 BE207855 AI872457 AI206292 AA223534 AW364783 AW364715 AV645744 H65388 BE170476 U46375 AA234504 AA285262 AA055428 W52943 W78060 AI669713 AI804895 AI056890 AI202008 BE504324 AI638488 AI991279 AW301184 AI990138 AI765837 AI523554 AI735158 AI637794 AA922055 AW069634 AW875295 AW002630 AI089420 AA535017 AI652587 AI657071 AI637803 AA677262 AA865617 AI699986 AA223477 AA554162 AW606040 AI078073 AA573096 AI057436 AI307113 AI983310 AA723619 AI659825 AW275484 AA552067 AW134930 AI038417 AI247714 AI678270 BE139653 AI814032 AI424176 AW874195 AA234118 AA843211 AW136280 AI468611 AI867879 AA495758 AA508603 AW006765 AI825647 AI867777 AI423688 AA037412 AA495818 AW590634 AA883349 AI969113 AW083463 AA054992
112098	659188_1	R44714 AI952898 AI623118 AI271632 T10160 Z40968
134332	16633_1	D86962 Z43779 AA298247 AF073378 AF000017 BE386788 BE146000 AL046008 AW951300 BE328763 AA565135 T17443 AW197239 Z39844 AW149267 R42775 W94026 AA133831 D81179 AW292896 W24533 AA340353 AW964788 R35792 W72778 Z20086 AA129406 AW665655 W94015 AW518912 AW385139 N92349 F28925 C15300 AI239534 AI358889 AI625560 AI936054 AI239416 D60096 AA808160 AA889642 AI360831 AW197699 AA136336 AA807872 H92911 AI123784 W72779 AI146976 AI023919 AI183855 AA298388 R85083 AW085113 R35681 AI560637 AF000018 R85130 D60097 R20996 AW370219
104254	28286_1	AW411425 AW411256 AW248441 AB011446 AF015254 AF004022 AA071235 AW245199 NM_004217 AB011450 AA070237 AL121492 BE264315 AA356271 BE253249 BE621112 BE256245 BE253568 AF008552 N49806 AW405819 AA352701 T25793 H51697 AI829974 W89058 AA297276 AW170452 AW249658 BE392539 AA070238 H81023 AW339856 N49700 AW406366 AA071486 AA720659 AA847804 AW411426 AW236354 AW411257 AI830139 AI348173 AI092097 AA807548 AI039321 AI280182 AA196757 AI803988 AA976765 H58497 AI953453 BE045492 AW294622 AA883408 H82885 R97912 AA810605 W88963 H81024 AW103189 AI453120 AA738386 T25124 AI582910 AI352050 AI802294 AI348029 BE561223 H57656 AW407129 R97911 AW951023
134351	16763_1	BE272506 U47721 NM_002997 J05392 BE259935 X60306 AL039256 Z48199 BE149524 AA425123 AA419287 AW630308 AL039215 AA219419 AW374657 BE081779 AW352196 AW602851 AA368110 BE078507 AA299561 AA377906 T58819 BE273643 BE541572 AA367994 AA100094 N93982 R22500 AA375599 AW998547 AW887074 AW631259 AW085777 AI660836 H13063 D58798 AA010621 T39490 AA001108 AA224261 AA366381 AI696816 W79383 N40117 AI219172 AW630029 AW079051 AI829106 AW439517 AI814283 AA579623 AW084866 AW170078 T92786 AI860472 N54556 AW009667 AI333283 AI348031 AA707206 AI831036 AA928681 AW337157 BE160976 AI422988 AA777013 AI691025 AA032042 AI831457 AI921282 T89395 T62508 AI566209 AW516825 AI758659 AI271852 AI677918 H01094 AI829280 AI224622 D59025 AA723113 AA601514 AW192078 AI224154 AI015641 AW182754 R68745 AA031960 AA583770 AA921870 AA632080 H00744 AI148519 BE206146 AA010622 R68690 AI247825 N76636 AA774612 AI078484 AA677405 N22040 AI432009 AA074511 AW662594 AA911301 AI342919 AA863447 AI474153 N26996 AA426099 W74093 AA001637 N69444 AA902587 R01486 AA639804 AA057472 AW050972 H13287 AW273894 AI872681 T47346 AI865585 T29391 AA745902 AA069313 AA443694 R22448 H70273 C00094 D29190 AA918847 AA577952 AW999231 N53786 T97945 AA586967 H00654 AA001255 H01095 AW376447 R70643 T53352 H03335 AA487014 AI346925 AW272885 AA829733 AI002312 AI991128 AI609012 AA917832 AA994510 AW151183 AW044410 T87877 AI744429 T70053 T53353 W96029 W52504 AW074106 AW571586 AA335556 AI355538 AI922244 AW276403 W52688 AA588801 AI493346 R82074 AI343474 AI693962 H95157 AA002260 AI590864 BE049626 AI206365 AI241074 AI610408 AI952089 AI014897 R00830 BE049407 AI820005 AI422564 AW511287 AW591439 AI864028 T58751 AA568360 R81546 AI282671 AI684071 AI950509 AI439380 T71663 W94662 AI678329 T49501 AI079708 AA995106 AA918622 AA502982 AA502632 AA548291 AI354395 AW000944 AW085741 D45578 AI826443 AI810939 AI301212 AI243066 AI699271 T87967 R81545 R53792 H12560 R24884 AI188950 W03268
110837	163104_1	H03109 AA190569 R27719 R77038 R23789 N41571 N34588 R26033 T94741 AI110626 AF063500 W35141 AA236329 H15136 AW043845 N23362 AA682872 H03110 AI168530 N32346 T94740 AA236561 AA236235 N23955 R27720 N31614 AI814425 AI804857 AW590744 AI080155 N30796 AI341754 AI367163 AI272814 AI332944 AA193683 AI183993 AI183991 Z39979 F04878 AI868457 N26707 BE535358 R23737 AW449959
134369	5386_1	AF207664 AW163724 AF170084 NM_006988 AF060152 AB037767 AL162080 AW630434 AI148739 AI686088 AW844411 AW163200 AA677116 AA368429 C03600 H27128 N88341 AI126019 AA373718 AW964293 AA345812 AW967361 BE047207 AI571069 AI335849 AI537518 AW168050 W47316 AL355724 R13547 Z43925 AI769318 R19976 W35345 W24878 AW194129 T95373 W07142 H28325 AA634915 T86778 T39243 T10738 AI370696 T36271 AW954313 AA296523 AA029247 AI369552 T40309 AA022997 AA011364 T41144 T41173 C18560 N59612 AA328867 AA040690 AA088617 AW167394 AA028018 AI569560 AW195344 AI089584 AA151507 AA133346 AI692832 R20636 AA031616 N91530 AI369060 AI755040 AI890478 AI985641 AI926525 AI654583 R76276 AW001362 AI887177 H28326 W92631 AI129429 AI719476 N40523 AW474740 AA022464 AA993528 N46572 AA129732 AI342643 AI144408 AA011376 T95293 AA057170 AW613713 AI280406 N95765 AA031474 AI128171 AI097021 AI684137 AI889755 N29991 H89564 W92688 AI953558 H98678 AI168616 W47201 AI690716 AA834490 AI160430 AW207161 AA677837 AW080654 AW104712 AI368138 AW474712 AI559164 H89565 AI185000 R76553 AA662930 AI340202 AA608802 AA757215 AA595069 AI199506 AI765271 AA028027 AA703651 AA918632 AI128696 AA903074 AI027793 AW204001 AI932695 AA846139 AI859558 AI537176 AI040586 AI270245 T40492 AA987460 AI160028 W23529 AA029035 AI827556 AA904875 AA706779 AA807465 AI689182 AW050514 AW150550 AW150472 AI648649 AA781059 Z41664 AA897320 AW050517 R45078 AI933450
110844	26206_1	AI740792 AI949422 AL079298 AI423046 N31952 AW195192 AV660395 BE543143 AA658285 R89611 R88931
133731	33199_24	N71725 H73296 T58304 H94803 H71098 R97116 NM_000517 V00488 V00493 R98241 H62729 H02536 H93953 H93849 R83420 R97372 H74255 H73034 R92870 H50844 R91252 H82329 H50974 R73807 R26201 H50967 H81482 H78630 N94123 H69920 R89892 AA340135 R97379 W03876 H19610 T58178 N78051 W25742 H78463 R63791 H63594 R83842 AF097635 H73826 R94380 H47962 T53050 T54718 R64416 R74107 AF147332 T53241 H01120 R69900 R63176 R78653 H81168 R80097 R66776 H66298 H60727 R87144 R99227 T67143 R99448 H52368 H50753 R76757 W01513 T59136 R70829 N77678 R80500 H78988 Z84721 N77683 N49814 N49427 AL038057 T52784 AA176749 N74739 W03863 T56842 N73036 T48014 N58317 N23926 AA766008 AA054580 N27635 R24279 AA458708 T51591 R34838 N63760 T58643 T54776 T56870 T52464 R26296 R48863 R64108 T52509 AI266020 T56462 T52644 AW950562 T54777 T50483 T54790 T53061 N49288 T51607 R52129 T50474 H65397 T55568 H93336 H00452 R81632 N71325 T52168 N71376 AI497856 R39511 R80225 T50668 T52574 AA069455 T52166 R28311 H68765 R89496 AA182860 T54943 T56607 T52370 R68553 H73383 H94478 N74134 T56851 Z20477 H47886 R95766 T50309 H38014 R71482 R26898 H03665 R77486 R82305 R69335

133740	26830_1	AW162919 AL050259 NM_004761 Z97184 AA640291 AW606692 AW246097 T08669 AL047730 U68142 AA910103 T80173 R17716 R25789 AW367388 AW175613 D85757 C04496 AI686948 AA369649 BE617744 AW129501 AW166092 AI963470 AI199238 AI884759 AI972097 AI143863 AA453509 BE336660 AI811410 AA902192 AW151682 AI688884 AW000804 AI024368 BE047332 AW339091 BE350021 AW338566 AA961769 AW950817 AI823704 AI435442 AI168340 BE047303 AI632056 AA404233 AI634306 AA007622 AW089074 AA916663 AI198501 BE042528 AA845142 AA740795 AI215659 AI312894 R37588 C02440 AA830137 AA453510 AA860919 AI760689 AA828494 AW840260 N80842 T80183 AI192854 AA613311 AW816806 AA135176 AA035367 T49125 AA639686 AA442982 AA402117 T30397 AI078067 AW190739 N27365 AA813552 AA613813 AA505865 AA506506 T08668 AA401972 AA854089 AW132030 R41786 AA526375 AA458470 AA907444 AW339956 N99972 T32323 AA687824 T32376 AA636046 AI401093 AI749004 AI222452 AA569896 AA699480 BE206118 N75044 AI439196 AA454684 AA987257 AI351217 N92937 AA007661 AW389309 AA456333 T87606 D31579 D30835 T49124 BE042568 AI690934 T31165 AA843733 R86012 AA135350 AW389311 C03271 AA345798 R46788 N27045 AA995286 AI572405
103677	41847_1	Z83806 AJ132091 AJ132090
133797	14537_1	AL133921 BE389006 NM_005056 S66431 T07054 AW500214 AW604275 AA487706 AA211245 AA247515 AL133922 AA311252 AA487492 AA312860 AW268369 BE328608 AW105357 AW468600 BE535444 AW672876 U25911 AA877356 AI587632 AI609139 AW500785 AW997007 AW847840 AW370915 AW370913 T60896 AA101935 AW191714 AI676232 H06919 T59110 AA665509 AI866620 AI890038 BE301184 AA633020 AI146438 AI088562 AA778271 AA572820 AW182989 AA101936 AA149972 AW373677 AA056587 AI189146 AA194891 AA884333 AA996366 AI972293 AL039952 AL048473 AI693257 AA165428 N42199 R64192 AI682230 AA460756 T55996 AA460157 AA884291 AI654969 AI014993 AI807648 BE044209 AW594737 AI199395 AW296902 AA354250 AA399998 AA327076 AI700672 R64102 T59036 AW014952 AI695952 N20368 AI492362 AA906265 AW300068 AW572973 T29558 AW949803 AA761392 AA128422 AA129842 AI393285 H06876 AI040173 H24862 AI081931 BE467125 BE464863 BE219481 H24863 AW304389 AI221831 AA662088 AI537156 AA662123 AA548129 AA357123 AA635823 AI184593 AA165427 AA056492 N89116 AA249262 AA090888
133799	14540_1	W24087 AA428006 AA490408 AA337922 AI291297 AL110297 NM_015415 AW160443 AA306892 AV647213 AA341034 AA296279 H80945 AW675361 AA082259 AW406543 AA034979 BE002719 AW373227 AW373260 AW875261 AW991430 AW875387 AW373224 AW580714 AW875373 AW875390 AW875323 AW991424 AW393069 AW576748 AW581565 AW875392 AI192351 AW274556 AW341482 AW674758 AA969478 BE122712 AI457696 AI241221 AA935160 AI073372 AA747666 AA532390 AI150824 AA236527 AA836680 AI126569 AW020703 AA847379 AA034912 AA490310 AI370587 AA427895 AI066462 AI750138 AA476719 AA938503 AA456421 AA281132 T25464 BE222761 AW875310 AW875322 AI191421 AI743446 AI086059 AI421846 AI221065 AW662500 AI569047 AI302685 AI869738 AW162453 AI032331 AA576425 AI286210 AI400077 AA650374 AI025206 AI214417 AA435919 AI264013 AW361280 AI268127 AI143814 AW402014 N92838 AI097003 AA165350 AA862308 AI347735 AA164559 AA490322 AI342201 AI091667 AI074045 BE122708 AA188818 AI342770 AA157009 BE165950 T56355 F21881 AI537284 AA740314 AI866755 AI349589 AA515191 AW291939 AI972418 C02120 AI559371 AA876641 AW197038 N91910 AA807386 AI468060 AA216134 AI630442 R88195 AI525508 AW662869 T58504 AA188876 W25063 AA490426 AA102193
125924	16783_1	BE272506 U47721 NM_002997 J05392 BE259935 X60306 AL039256 Z48199 BE149524 AA425123 AA419287 AW630308 AL039215 AA219419 AW374657 BE081779 AW352196 AW602851 AA368110 BE078507 AA299561 AA377906 T58819 BE273643 8E541572 AA367994 AA100094 N93982 R22500 AA375599 AW998547 AW887074 AW631259 AW085777 AI660836 H13083 D58798 AA010621 T39490 AA001108 AA224261 AA366381 AI696816 W79383 N40117 AI219172 AW630029 AW079051 AI829106 AW439517 AI814283 AA579623 AW084866 AW170078 T92786 AI860472 N54556 AW009667 AI333283 AI348031 AA707206 AI831036 AA928681 AW337157 BE160976 AI422988 AA777013 AI691025 AA032042 AI831457 AI921282 T89395 T62508 AI566209 AW516825 AI758659 AI271852 AI877918 H01094 AI829280 AI224622 D59025 AA723113 AA601514 AW192078 AI224154 AI015641 AW182754 R68745 AA031960 AA583770 AA921870 AA632080 H00744 AI148519 BE206146 AA010622 R68690 AI247825 N76636 AA774612 AI078484 AA677405 N22040 AI432009 AA074511 AW662594 AA911301 AI342919 AA863447 AI474153 N26996 AA426099 W74093 AA001637 N69444 AA902587 R01486 AA639804 AA057472 AW050972 H13287 AW273894 AI872681 T47346 AI865585 T29391 AA745902 AA069313 AA443694 R22448 H70273 C00094 D29190 AA918847 AA577952 AW999231 N53786 T97945 AA586967 H00654 AA001255 H01095 AW376447 R70643 T53352 H03335 AA487014 AI346925 AW272885 AA829733 AI002312 AI991128 AI609012 AA917832 AA994510 AW151183 AW044410 T87877 AI744429 T70053 T53353 W96029 W52504 AW074106 AW571586 AA335556 AI355538 AI922244 AW276403 W52688 AA588801 AI493346 R82074 AI343474 AI693962 H95157 AA002260 AI590864 BE049626 AI206365 AI241074 AI610408 AI952089 AI014897 R00830 BE049407 AI820005 AI422564 AW511287 AW591439 AI864028 T58751 AA568360 R81546 AI282671 AI684071 AI950509 AI439380 T71663 W94662 AI678329 T49501 AI079708 AA995106 AA918622 AA502982 AA502632 AA548291 AI354395 AW000944 AW085741 D45578 AI826443 AI810939 AI301212 AI243066 AI699271 T87967 R81545 R53792 H12560 R24884 AI188950 W03268
135015	34946_1	AW361638 AW009334 AA776753 AI580431 AW411290 AA281800 U54999 AA247905 AA249103 AA375000 AA369034 AW951354 W92010 R25539
112170	64558_1	BE246743 AA436942 AW024744 AW242177 AA975476 AW385185 R07536 R73462 AV654529 T57442 AI399986 R50073 R48743 AI769689 AI863005 AA317806 AI678000 AW189963 AI986207 AW471273 R73463 AI335104 AI590161 AI469257 AI954604 H21954 T25141 AA856793 R50074 AI708253 AI217945 AI224459 AA505828 AI521061 AI651948 AI919161 AI766992 AI287290 AI868191 AW956075 AA335980 AA335672 AI424272 AW572622 AI500040 AI553687 AI932452 AW196184 R48744
134421	17110_1	AU077196 J04478 NM_000393 Y14690 AW239129 BE018496 AW068123 AI750528 X04758 AI828712 AA577121 AA853106 AA320450 AI750939 U53092 AA334363 AA486225 M10956 W05131 AA373460 AA247709 AA328980 AA092106 AA330038 AA304992 AA386156 AA331327 M11718 AI751005 AA305175 AW955473 AA342316 AW950601 AW849233 N42734 W52306 AL038512 AA332886 AA332661 AA332101 AA853780 R58798 AA040410 AA332339 AA334576 AA091436 AW068455 R09649 AA114947 AI567519 W93869 AW372828 AW372820 AW393330 AW386363 AW393342 AW372817 AW393339 AW393324 AW393333 AW840441 AW840379 AW393335 8E167044 BE070635 AW393329 AW608872 AI963125 R07913 AW608870 AI609225 AA010309 AW840403 AW840445 AW840390 AW840345 8E070633 AW840464 AW840371 AW840436 AA333851 AA092962 AW840569 AI884581 AI953978 AW840566 AA004204 AW393334 AW393343 AA334087 W24174 AW150834 AA095583 AW372823 AW393338 AI858101 AW840529 AW840568 AI281477 N32519 AW840375 T29615 AI814914 AI570898 BE070542 W05395 AA706823 AA599504 AI262822 AA329445 AA330407 AW088731 AI122842 AI128830 AI754803 AA676903 AI127349 AI582477 AA486379 AA600038 AI589319 AA903134 AW840521 AI083555 AI755281 AA035380 AW804130 AI088658 AI143031 AI354707 AW804069 AI580763 AW804101 BE089359 W02000 R95826 AI086998 AA578679 AI346302 J03051 AW088383 AW840365 N68613 AW393337 AI075140 W87515 AI342335 AI417127 W93848 AI935300 AW886342 AA853107 AI147454 AA348035 BE090787 AI750253 H59312 AA232701 AA194797 AW196741 AA040329 AL038513 AA194648 AA328379 AA233015 W57799 AW372121 AA346374 AA706805 AI670785 AI750527 AW792942 AW792970 AW068714 N75508 C00044 AI751004 AA091990 AA723122 AA093252 N87869 N89578 AW068212 AI052797 T49492 AW302579 AI753788 AW069514 AI357733 AW751666 AA505831 AW073493 AI200515 AA974667 AI560062 W87487 R95777 AW780128 R77205 AA058930 AA099728 T27809 AI382841 AI688861 AI589497 R86097 H39522 H45011 N76100 AW385366 AI752198 AW385329 AW385351 AW385359 AW792894 R09536 T31628 T31631 T31612 AW834785 R69515 T24745 D62992 AW605897 AA122291 AA361011 AI341677 AA150616 AA725207 AA127736 AA344504 AA137193 BE153409 AA452231 AW835203 AA442665 AA449381 AA329886 AA330396 AA099729 AW839760 BE049568 BE177845 AW385337 H13571 R27886 AW875656 H87987 AI751983 AW875865 AW875887 AW579855 AW608741 AW069271 AI755045 AI753615 H03527 C02028 AI160667 AA328122 AA121511 AW020206 AA070970 AA343104 AW069115 BE150497 T49493 AI888126 AA993150 AA599273 AW937969 AI654845 AA137194 AW937892 AW191921 D62061 AA334999 AA609330 AW875872 AW771446 BE502145 AI090089 AW780273 AI127162 AI697486 AW439391 AW572213 AW021109 AW008422 AI371826 AA010310 AI692736 AI160542 AW592395 AI127946 AI864906 AI077562 AI304554 AI446310 AI457114 AI214470 H13204 AW074603 BE302102 AI754320 AW875878 AI671130 AW069432 AW291469 N63241 AW340511 AI268892 AI095555 AI754231 AA857098 AA573183 R27794 AI919268 AI039775 H03445 AA142904 H44959 AI094661 AI865506 AW088208 AW235794 AA122386 AA852331 T63108 N64280 AI263967 AA343018 AI569315 AI537624 AA594297 AI751984 AA342315 AA449254 T03859 H88165 AI537635 AW084603 AI564735 AA115948 W30698 AW883468 AA878466 AA096062 AA115524 BE167017 AA703985 AA705256 N43019 AW393341

134444	33247_1	BE184455 BE396187 AL035660 NM_003064 X04470 AA132992 AI862145 AI564623 AA572950 AA993549 AA026099 AA460433 X04503 X04502 AA026192 AF114471 AI858387 AI885550 AW264225 AI638119 AA564454 AI222907 AA541595 AA587161 AI743345 BE044073 AI742512 AA551908 AW238407 BE392080 AA397776 AA863166 AA587140 AI042208 AA683520 R71834 AA026497 AW081599 AA932864 AI580185 AA316675 AI000873 AW513394 H65171 BE612494 BE612943 AI377093 AA938592 AI148713 AA594366 AI042358 AI282099 AA878509 AI126451 AW302276 AW510396 AA991397 AI066534 AA993550 AI276644 AW305053 AA026264 AA975787 AW103765 AA026420 AI311077 AA903202 AI347358 AA557989 AI300095 AI813709 BE184402 AA460434 AI302183 AI096385 AI024981 AA132956 AI184947 AW470608 AI358410 AI811543 AI418421 AA936659 AI275993 N23232 AI422607 AI628518 AW190157 N27733 AA026641 AW472804 H65117 AI684142 N25032 AA164414 AW167388 AA165295 N23721 AI675729 AA829536 AA169507 AA160175 T68535 BE181364 AW088845 T28664 AI399779 AA643910 AA165296 T68469 AI363937 R49912 AI784193 AI991241 R71785 AI800677 AW794052 AA995549 AA164415 AI718351 AA419259 AA588301 AA401179 AW391622 AA485776 AA485649 AI970057 AA587129 AI685920 AI589995 AA886793 AA478097 AI363962 AI540954
127229	11897_1	AA316181 BE439545 AC005053 AF186249 AW386101 AC004969 AA730199 AA032221 AI686139 AI167942 AA809228 AI184070 AI394674 AW969977 AA032279 AW079284 AA513174 AA888312 AI453179 AA483363 AA528432 AA579511
127236	19449_5	AW661857 AI915426 AI341818 AI204517
134454	35303_1	NM_013230 L33930 M58664 AI905918 AA434132 AA904758 AA588618 AA594622 AA948567 AA527668 AI907434 AA862503 AI745625 AI189061 BE174316 AA468774 BE002291 AA725505 AW176047 AA894539 AA988737 BE090598 BE090586 AA677897 AA937588 AI348033 AA367135 AW375476 AA385290 AW375573 AI310309 BE148067 BE006010 AW510588 BE002449 AW176070 R45919 AW937774 AW372169 AI005477 AW375919 AA233381 AW363508 AW363501 AA349672 AW376020 AW363574 AW959345 AA362098 AA164354 AA367166 AW873216 BE000889 D87667 BE164344 BE062266 AW607225 BE064576 W39287 AW610129 AI885465 AA445951 D51997 AA411741 AA632836 AA317144 AA058499 AI564540 BE176594 AA371311 AA295400 AW601989 BE090755 D54335 D54370 D53586 D55388 D55061 D54957 R29242 AW864980 D52634 R23787 AA430088 AA962260 AW151335 W06968 AA165306 H04204 T18454 BE612502 D51399 BE168228 D54311 BE004449 AA300121 AA523877 AA430446 AW392680 AW392679 AI300582 AI626053 AA610627 AI810781 AW089838 AI300587 AW371645 AI857812 AI859979 AA729544 AW151626 AA772990 AA845164 AI720288 AI679250 AA831488 AW168119 AA136096 AW162096 AA972782 AA587042 BE172059 AW055310 BE046866 AI986140 AI744399 AI446769 C05711 AI801851 AI925745 AI559460 AI748785 AI801199 AI264631 AI635844 AA299240 AA299241 AA299414 AI275244 AI799457 W31859 AW473701 N78899 AI626045 AI446550 AW946403 AI275112 AA629868 AI948969 BE219021 AW269521 AI245637 AI568016 AI570341 AI687736 AI912508 AW129471 AA446458 AI926301 AI697327 AI796682 AI627199 AI571997 AW005027 AI679826 AI580230 AI610148 AI559396 W60476 AA464857 AW237865 AI683443 AI610541 W73562 AW511411 W73581 AW439864 AW024739 AI569460 AI308094 R77796 T85259 AA209488 AW473796 R96739 AA506567 AA165307 AA136165 H04205 AW191964 AW001833 AA197340 AW473849 AI537898 AW572099 C75355 AI888628 AI537886 AI302906 AA493556 AI973160 AI244703 AI537165 AW272161 AA970748 AI926035 AI341007 C75315 H59916 AI832273 AA583306 AI869784 AW887507 AI669500 AI804770 AI926216 AI701366 AW028195 AA505677 R23736 BE153112 BE139498 AA991452 AW992492 BE153248 AA807755 AI433971 AA164903 AW162585 BE168971 AA732914 AI312727 AA700369 AI619791 AI085826 H45709 AA971080 AA845730 AI654466 AW571969 AA372945 AI671427 AI908193 AI908184 AI908173 AI908183 AI908190 AI908174 AI908185 AI908189 AI908186 AI908187 AI908191 AI244244 AA493617 AI908192 AI972647 AI290408 AI287904 AA631331 AA508879 T32271 AW002782 AI582423 AW517532 AI539148 AI824403 AI302867 AI933821 AI287336 T03913 AI678303 AI470699 AI915702 AI758491 AA977101 AI367376 AI870452 AW496810 AI302938 AI559862 AI468929 AI569907 T03853 T30204 AA662349 AA658971 AW818354 C20918 AI611355 D25554 AA910304 AW198061 AI687539 BE074794 AW995748 T03912 T03852 BE082213 BE174465 AA453342 AW844350 AW603902 BE176743 BE004975 BE074755 BE074661 BE090606 BE176758 BE173074 BE004516 D55070 BE002011 BE172645 BE090594 AW999864 AA339261 AA343589 H59915 AA357314 AI123763 AA453217 AW996441 BE082136 AA384370 AA340742 BE081952 AA384272 R78158 AA367413 BE001850 AW580006 T08552 AA349978 AA610643 BE000015 AI766762 AA300134 AA747175 BE180467 AI905702 AI214104 BE174082 AW376653 AW376759 AW848546 AW376799 D54438 AA384504 AA384911 R81453 D55004 BE613090 BE272356 AA780152 AA761181 AI559700 R91610
110930	127662_1	BE242691 AA700942 AW242679 AI367403 AA193579 AW016712 AA806667 AW469266 AA194800 N75463 AI350692 AI982662 AA100138 AI017903 AI272803 N48603 AI671216 AI760490 AW510307 AW003140 AI760463 AI492196 AI380897 AI692959 T81970 AA744442 T81542
110932	9346_1	AA021459 AL157453 N48694 AW898879 H06850 N46609 AW014561 N51002 AA482856 AA482842 AA482868 AA885753 AI628670
134470	17294_1	X54942 NM_001827 AA419596 BE566311 AA292964 H91988 AA234001 AA306157 AA252386 BE566951 AW172736 AW949804 BE019764 AA745959 W92388 R00665 AA644467 AI160521 AA010065 AI167445 AI375953 AI375935 AI219021 AW172922 W92332 AA526800 AW327300 H89939 AA729171 AA729539 D19699 AA234002 W15179 T29560 AA305796 BE164003
104394	22050_4	AA129551 H46617
103739	110079_1	AA115173 AA075221 AA075709 AA076354 AA083101 AA085391 AA070684 AA083368 AA076395 AA076396 AA075779 AA083500
133820	27806_2	S69681 S69680 M13686 AW502119 AI193546 AA910449 M30838 AA970237 AA928513 AW268995 AW205504 AA491477 T63632 AA488018 AW275908 AW087774 AA969323 AA969402 AA994009 AW662888 AI191424 AW274542 AI185334 AA770654 T60105 AA486609 T59747 T62701 AA315974 AA487660 T39218 T39235 AA775183 T63485 AA487757 AI821350 T63560 AA487056 T39248 AA487096 AW268523 AA630447 AA663970 AW271249 AW262256 AA630518 AA487450 AW276064 AA488069 AA977012 BE328823 AI299538 AA634768 AA634025 D45697 AA926698 T63653 T63908 T94546 S69791
126645	11897_1	AA316181 BE439545 AC005053 AF186249 AW386101 AC004969 AA730199 AA032221 AI686139 AI167942 AA809228 AI184070 AI394674 AW969977 AA032279 AW079284 AA513174 AA888312 AI453179 AA483363 AA528432 AA579511
103797	109699_1	AA080912 AA075318 AA083403 AA076594 AA078992 AA084926 AA081881 AA113913 AA113892 AA083821 AA134801 AA082953 AA070343 AA062835 AA075419 AA063293 AA071252 AA078900 AA062836 AW974305
133886	14865_1	U97276 NM_002826 AW268982 AL042393 AI750566 AW068508 AL042118 AA675908 L42379 AI460098 AA375375 R88085 AW583087 AA634510 AW843402 AW366299 H78270 AA358959 AW959189 AI906500 W51802 N28303 AW362572 AA425481 R12312 AW815562 AW815518 AW815532 BE407187 AW815423 BE540993 BE254859 F13473 T74161 T89894 BE296648 BE299756 R72745 W00849 R17397 AA378713 AI752636 W47068 AW451378 AA291759 AA335801 R22462 AW960615 H78358 W73493 AA631167 AA569359 BE386345 N50154 AI199150 AI986162 R42633 R25868 AI802749 BE222099 AW242272 AI249022 AI798888 AW410048 N53572 W46968 AI750698 AW769273 AI269760 T89619 AW068770 AI991132 H99489 AI829238 AI823721 AI074884 AI359292 AA969412 W73574 AW444839 AA090268 AA368461 R72746 AI678870 AW368846 AW368816 AA311282 AA906143 AA971683 AA744065 AA744106 AI066455 AA846698 N30659 AI983057 AW026585 AI916350 AI677873 AI149001 AW469153 AW081661 AI355535 AI221419 AI085982 AI188675 AW193368 AI333700 AI610674 AI358823 R84988 AA464152 AI077668 AA433854 R88086 AI469130 AI095539 AA947617 AI910564 BE077429 AI301310 AW304341 AI193681 AA947615 N26760 AA292682 AA434375 AI818592 AA826496 AI401585 AA470775 AI187738 AA298131 AI587057 AI536760 AI582920 R37241 AA551891 AI184397 F10241 AA865219 AI250666 AI205923 AA878115 AI891055 AI768178 AA907719 AI687947 AI801778 AI221415 W74434 W79188 AA577088 AI798472 AI559148 AW601460 AW602641 R26680 AI202219 AW602665 AA367691 AA934351 BE410383 BE005882 AL046719 AL041878 AL046353 H44278 R25042 AW410047 AL040884 AL046698 AW815531 AW815383 AW815420 AW815536 AW391301 AW815385 AW815364 T84067 R10965 R10912 AW380777 AA065020 AW371383 AW815728 AA595714 R43801 T86108 T48538
133893	14927_1	AI434699 X01060 NM_003234 BE256019 BE142860 BE142729 AW500605 AA347570 AL120908 AA082493 AW630459 AW501236 BE009458 AW503924 AA055688 AA216664 AW802703 AA877477 R82301 N85217 AA134422 H02417 AW389909 AW389907 AW389913 AW389877 AL046375 AA488721 R95492 AI189434 AI132910 BE092247 R11868 F05413 N85500 H60074 H02305 W95694 D59086 R82712 AW402489 AI630673 AA132188 AW629714 AA581142 R19476 AA033935 AW862307 F12939 BE536497 F12950 H13379 AW815251 AW861747 AA490726 AW861754 AW858119 AW861737 AW366658 AW858160 AW858110 BE010851 AI630422 AI630188 AW852822 F12235 AW935236 T66396 F07003 F06134 AA279609 W25236 AW904519 AA689397 T93034 AW672879 N27985 W94700 R80466 AW672950 AW815197 N44949 R82022 N36574 BE090822 BE090815 BE090816 AI630083 AA010798 AL039227 AA094713 AW875438 AW875695 R66329 AA095005 AA094771 BE092490 AI630297 AW875916 R36193 R23888 AW875696 D20720 AA252852 H04165 R29433 AW875844 AW575175 AA806223 AA527154 R31997 W42895 AI051604 BE042743 AA740874 AI018806 AW168040 BE220532 AA524174 AI491927 AI473960 AI160447

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105011	6948_1	BE091926 NM_006461 AF063308 AW246310 W94875 BE293514 BE091862 BE091863 BE091910 AL041446 BE091916 BE296565 AL137585 W93404 AL039797 AA853256 AA332773 BE391536 AA131484 AA148724 AA115978 BE541379 AL122116 AA070390 AW887577 AW175976 BE619622 AL041841 AW250305 AL041447 AA249507 AI138779 AA598727 AW149054 AA131171 AI631485 AW613280 AA070391 T86847 AW249545 AA886967 AA605095 AA644113 AA115979 AL043729 AL043728 AL043765 AI660376 AI079510 AW250980 AA132223 AA971754 AA541345 AA853255 AI745706 T97349 T86656 AA132327
105012	5687_1	AF098158 AL120028 AW629818 AB024704 AI206883 AI654707 AA158331 AA310249 AA306686 BE314654 AA379553 AA135066 AA333019 AB027467 AA158654 AA116035 AL044513 AL117534 AW295988 BE066858 AK001391 H69176 H73968 R96494 AW367308 AL046501 BE206847 AW363720 R58761 N55662 AA249322 AA953186 AA134490 AW674890 BE149647 H73329 AA159064 BE244510 R96540 BE081793 H69175 AA303255 H68297 AW408298 AW408297 AI950056 AW838698 AA337269 AW858823 AA218615 AA306617 AW955262 BE256349 BE386559 BE275395 AW513669 BE175417 BE251038 BE395442 AA353109 AW957319 BE619311 AI630209 AW937114 AW361680 AA136254 R29286 BE616205 AI632275 BE615883 BE615281 AW605285 AW604395 AA292987 AA450276 H68298 AA807738 AA158040 AA595755 AA157993 AW731997 AA279247 AW394245 BE150890 AI672701 AW615751 AW977833 AA936183 AW376724 AA861636 AW574838 BE617939 AI355063 AI827709 AW294731 AW069337 AA805397 N52991 BE046370 AW615684 AA218616 AA279210 AI610434 N89268 AW872956 AI670125 AW452411 AA134938 AA581835 AI672735 AI609609 AI922954 AI140381 AI222769 N54313 AI583523 AI024647 AA134491 AW272722 R06239 AI366952 AA135938 AI700357 AA398451 AA678766 AI090872 AA947182 AW674033 AW170336 AA809443 BE045316 AA779113 AA630611 AI288417 AL044514 T51634 AA626627 AW672972 AI936743 AI003531 AL040256 BE536573 AA116036 AW020234 AI696422 AA809459 AW590332 AI824928 AA911039 AA976920 AF244547 AA534688
105039	137669_1	AA907305 AA130348 AW277052 AA366056 AW960004 AI243620 AA228511 AA902186 AI572237 AW340595 AA992201 AA602572 AA130349 H50751 R63643 T80979 AA558367 AA588171 BE043192 BE043580 BE043743 BE043768 BE042032 BE043400 AW301377 BE043489 AI344150 AI311691 AI249572 AW274364 AW268772 AI224233 AI590456 AW302913 AI345856 BE138608 AI583641 AW086290 BE042169 AI345938 AW301796 AI224718 AI371551 AI583797 AI349757 AI344002 AI345922 AI250006 AW268755 AI802798 AW269120 AI284680 AI255085 AI311607 AI284643 AI310868 BE043571 BE041781 BE043280 AI343068 AI223469
105076	47218_2	AI598252 AA448763 AA142858 AA314199 AW056047 AA090265 H60157 W57916 AF086234 F22165 AA056029 BE396782 W57917 F27183 AA975000 AW007218 AI583241 F32178 AI563924 AI500207 F36633 AW051788 AI241216 AA630401 AA448666 AI734878 AI015250 F23448 AW603082 AA708925 AA372713 AA469104 AA304316 AA372977 AA452900 F33453 AA728846 AA933045 AA888287
135192	5741_1	U83993 U87270 BE439498 NM_002560 Y07684 AA316197 AW954722 AA975735 AF000234 AF012903 T53417 AA452777 AW604427 AI205525 AW959349 AA298113 AA337884 AW024997 AI633687 AA359184 W30955 AW295511 R60723 AI082452 AI032800 AI824276 AA843367 AI190193 AI432157 AA972272 W02801 T53418 AA677220 AA838236 AI765489 AA700841 AA452596 AW136770 AA630980 AA995011 AA977728 AI954259 AI300715 R10377 AA302820 AI797307 AW874145
133903	14969_1	X63692 NM_001379 AW502857 BE397040 AI798071 AA490926 AA761775 AW183093 AA935652 AI269110 AI830747 AW505569 AA878256 AI991441 AA719875 AW015453 AA417865 AW503606 AW505299 AW503793 AW504938 AW500273 AW503403 AW504614 AA093687 AW500658 AW504739 AW500610 AL135282 AW804511 AW505281 AW503375 AW503302 AI003012 AW503566 AW505245 AW502737 AW407657 AA323060 AW500279 BE088611 AW408532 H51721 AA522689 AI240655 AW407372 R83279 AW501165 AW500841 BE294986 AA305721 C75196 AW402456 H24268 BE267863 R98901 BE297878 BE559932 AW401578 AA424953 AL046576 AA380578 F08260 R17473 H09054 AA121560 AW602088 H05995 AA677275 AA352850 AA769959 AA360481 AA352944 AI418351 AW293021 AI270781 AI952903 AI742433 AI564492 AI625978 AA622973 AI141776 AI499287 AI208257 AA580154 AI188287 AA401450 AA424954 BE222766 AW473899 AA714556 AA743925 AI620072 AI439509 AI033322 AA806335 AW439248 AI003132 H09055 W60515 AW341814 AW190835 AI952396 AI701552 AI701562 AI174310 AW173473 AW272197 T97335 AI078013 N34857 R98675 AA121699 AI084113 AL120771 AI475941 AI422863 R42819 N52989 AW338649 AW575787 AW516098 AW020720 T29495 AW951377 AA887736 AW575686 H05948 H22876 AW574994 H27322 AW576425 F04487 D19819 AA417716 AA832060 AA815271 AI241589 AI003705 T19259
133908	28620_2	AU076820 M83216 AA971545 H51609 AA092764 AI926727 AI801609 AI888318 AW950682 R99241 N42334 T68396 R24753 AW083647 R01328 H50950
133944	5151_1	AW068579 AI205108 AL049969 AA249019 AW068578 AA056648 AA056482 R58113 AA056676 F13429 F11610 AW840189 AW948891 AA338450 AW952752 AA056553 AW993964 AW993974 AW993980 AA446789 AA166952 AW993961 N40598 Z42290 AW948852 W01690 T84498 AA284997 T77159 H60865 AA094499 Z43304 BE173592 AL036483 AI972279 H05379 AW292994 AW296424 AA133268 AA131812 AA453323 AA448120 H93597 AA031743 R68125 AA129772 BE172377 BE544374 AW369298 AW901935 AW369297 AW369263 AW369306 AW369270 AA126199 D62661 AA045870 AA131742 AI598238 AI080612 AA216416 AA522741 AA166788 AA904632 AI332596 N27826 AI142437 R37649 AA004512 AA004459 AI492985 AA284971 AA432103 AA614664 AA542827 AI149121 AA669523 AA045803 T83862 AI620824 AI805311 AI074427 AW192347 AI126537 AI858132 AA026983 AI078530 AI916697 AI206829 AI868017 N71661 AA127220 AA447977 AW194084 H05325 AA469189 AA775907 AI597982 AA678720 AI581612 AA469120 T76992 H11520 H60866 AI382065 AA133788 AA503687 AI863713 AA847108 AA031653 AI371363 T32076 AA876618 R68086 Z39378 AI864225 F13741 AA886579 AA887825 AI954531 N55800 N59149 F09246 D79619 AI279779 D62621 AA516488 R57146 AL080032 D20274 AI868600 AI625136 F01813 F09265 AA888263 AI074624 AA888262 AA934459 AA992530
133968	31286_1	AA355986 AW965776 W07702 W67356 AI373166 AI655916 AI869991 T87392 W86816 R02541 AW770573 AI499318 AW241688 AA975344 N80580 AI051560 W67260 AA826947 AI088230 AI052067 AI367546 W87003 AW297928 R00059 AW293052 AI369468 T79856 AW294224 T85742 BE046326 AA722708 AW191634 AA490795 AW118587 AI127858 AI288493 AI288615 T90835 T90813 AW514553 BE464846 AI610836 AA490600 AW085067 AA687786 AI591345 D15050 R22712 T27043 R22765 W31576 T27044 N26347 T27003 F11195 BE408487 AA773913 R53292 T10113 AA252877 AA033540 AA675918 AA150877 AA490371 AI567864 AW195477 AI567529 AI700749 AI475792 AW803195 AW820137 AV658376 BE439674 AW058046 AI434821 M78443 AA386182 AW338461 AI766237 R87137 AW271729 AI459830 AW340247 AW193806 BE221907 AI760453 AI935475 AA505626 AI149367 AI126214 AI300513 AW473504 AI096818 AW769876 AA628106 AI935110 AA976973 AA827397 AI373541 AI292008 AI572689 AA929080 AI073528 AI968673 AI961943 AA034023 AI492567 AA595290 AI591158 AA150750 AI624901 AW664088 AI225091 AW338771 AA878624 AI335611 BE246155 N23385 AW167453 AI914057 AI566400 AI362466 AW235573 AW205703 AI075112 AW999675 AW236654 W04652 AI700645 AA252899 AW779263 AW291852 T10112 AW207331 R52638 AI962070 H99228 AW183560 AI914628 R87138 AA732161 AI567585 AI418807 F11004 T27004 H46629 AI270118
120132	357774_1	W57554 D60903 C14589 C15135 H83629 H17143 AI243227 AI475903 Z38839 T34306 AW085505 D60592 H82752 AA886113 AI961641 D59909 D81156 D80799 Z38595 AI028272 AI125908 AI160678 AA774399 AA768768 AI580883 AA574171 AA928320 AW275377 BE243408 AA886081 AA663328
105162	3913_1	AL133033 AI095686 AW994533 AW501074 AB028948 AW361914 H85495 AI909786 AW365107 AA226992 AW938788 AW365084 BE300613 AA007546 AL137644 AA348189 AA314006 AW965318 AA332417 AW849166 AW367089 AW849180 AW849703 AW849541 AW367103

		AW849545 AW849228 AW082975 T10694 AW337934 AA846773 R99646 AW579773 Z45094 AW964243 AA386023 N99826 H77791 T80893 R95709 AA193217 N55908 AA418656 AA174145 AW368341 AW972060 AA449584 BE550214 AW864463 AW864397 AA910651 R95710 AI131165 R19049 AA810946 BE180116 H77622 AA668778 AW294688 R99104 AI636492 AW805508 AI802090 AW150158 N70687 T70316 AW805502 T72613 Z40829 AA042866 AW242513 AI741829 AA557208 AA418594 AI022383 T10721 AW090786 AA825153 AA551771 AI307392 AI278436 H99707 AA733000 AI122918 AI678973 AA449326 W87001 AA193218 AW262242 AI266651 AW614519 AI351781 AA176690 AA425079 AW964063 AI435168 M85549 AI536622 AA353413 BE466618 BE466662 AA496000 AI702078 AI250775 AW029439 AI659133 AI800652 BE045664 AI342915 AI342681 AI537979 AI827131 R44036 AI783734 AA857374 AI267518 T91175 AA044417
127435	7085_1	X69086 NM_007124 AW068350 AI276756 AA010522 AA010436 AA096390 AA808926 AW946518 AA092900 AA640706 AI933802 AW467977 X15488 AW837023 AW837028 AW837031 AA984785 AA331662 AW837040 W03101 AI208201 AA558709 AW273144 AI201281 AA634455 H78336 AA676840 AL046945 AL046967 T29210 AW965973 AI275523 AA233855 AI671796 AW451675 AI611085 AW449960 AA358108 AW965864 N98380 D30948 D31284 N45955 N26947 AA384318 H21757 W60040 T94506 AA204703 W84486 AA379354 AW963924 AA046146 W81048 AL046946 AW606721 AA634874 AW976587 AA744739 AI685733 AI949272 N98830 BE048727 AI623170 AW152488 AW029348 AI088454 AI566007 AI202340 AW193549 W81101 N70184 T48264 AI636267 AI735436 AI761576 BE045949 AI290430 AA503827 AI262075 AW236949 AW665647 W80432 AW236700 AW594040 W61339 T58091 AI970837 AA830152 AA830232 AI263107 AA046321 AI832981 AA860669 AI935758 AW770518 AI809597 AI692972 AI241862 AI377719 AI741950 AW057572 W32113 AI972334 AA025239 N36795 W55927 W55906 AI493394 AA765491 AI476244 AI088220 AA026026 AA570074 AA557618 AI978798 BE350227 AI978824 AW172473 AA771924 AI091618 C00337 AW946594 AA912617 AA993456 AI769854 W84563 AI474867 AI014410 AI422587 AW009137 H99081 D63010 AI914435 AI701280 T94419 AI868870 AW081817 W32171 AI829405 W80562 D82777 T48489
134656	17813_1	AI750878 AA853767 M14326 NM_003246 X14787 M25631 X04665 AA853089 AA773505 AA257124 AA235269 AA404574 AA461130 W16745 AI284148 AA236646 AI812030 AI250909 AI269249 BE465062 AI963323 AW028334 W30751 AI000621 AA291474 AA878172 AA460828 AA884883 AI000849 AI379665 AI263550 AA593663 AA884172 AA878373 AI803562 AI042554 N94526 AW192233 AI086533 AA257020 N77812 AA852575 AI092991 AA235270 AA236145 W52528 BE552472 AI928020 AI086779 BE089660 AW362285 AW362261 AW362367 BE089561 AI866968 AI588960 AI435009 AI804154 AI492979 AI041974 AA527055 AI763324 AA243572 N26247 AA526978 AI750209 AA256369 R52032 AI278172 AI306124 AI572353 AW614480 N35411 H26096 AA256479 AA464532 AA426510 AA243836 H24875 AW576784 N39897 AI753454 AA464630 AA256885 AI751155 AA852234 AA852974 AA256821 N48043 H40049 AW068763 AW067905 BE002241 AW994516 AI750449 AW753655 N42923 N85003 AW389277 AW995299 AA852235 AA852979 AW581273 AW868821 AW868820 AL047248 BE002218 AW068451 AW992583 AW994560 AW068086 AI752766 AW997017 AW752585 BE002552 AW847916 AW604150 AW604145 AA376395 N98278 BE168445 AW601027 BE168043 AI750877 AA027234 AA703916 AA852402 AV653807 AA368984 M99425 AA149184 AI692802 AA081392 AA853378 AA374765 AI281724 AI003785 AA600110 AA853090 AW994576 AI147763 AA149185 AL047409 AI750450 AW996793 AI768560 AA132207 AI765822 W93760 BE087365 W93493 AA027235 AW050808 AA308199 AW068710 AA373772 AA373735 AW954365 AA080998 AA147963 AA372834 BE158021 AA132064 AI597702 AA371272 W47517 N98350 AA853826 BE003134 AA852274 C01864 AA852340 W24155 AV656963 AI750260 AL079948 AA043624 BE158037 AA599373 AI750876 AA188473 BE151310 AW938210 AW938209 AA370310 AW938211 BE122739 AW938212 H62153 BE001303 H77645 AA007557 AW242688 AI752623 AI093436 N99136 AI755232 AW069822 AI754150 W47518 AA343622 AI373733 AA135843 AA373994 N63907 AI077756 AI828265 AL048098 AA164488 AW630665 AA043285 AI358576 AA344995 AI240286 AA056491 AI752508 AA343471 AW963038 AA037609 H98155 AW008151 AA493195 AA225530 AA775913 AA599857 AI659579 AA852724 BE122738 AA344177 AA419134 AI202460 AA329919 AA316388 AW193072 AA056585 AW893058 R78085 AW844061 AW843880 AW068403 AW068811 AA345809 AA313173 AW068176 D45506 AA226117 BE092720 N70154 AI950521 N32982 AW068363 AW068501 AI248597 AW615014 AI752767 AL048099 AA599930 AW068869 AA599790 AI754476 AA007558 AI750259 AI752622 AW613349 AI572033 AI677990 AI139209 AW449199 AI002688 AI678555 AA852401 D29388 AA852975 AW067935 AI753854 AA081394 AA225254 AA080999 H77646 AW769422 AW069887 T28616 AA852725 AI913010 R78033 AI269247 AI263852 AI755103 AL048309 AA853913 AA375073 AA037309 AA373962 AV656566 AA373293 AA327376 AA308864 AA095749
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134696	124196_1	BE326276 R33323 H01620 AI267763 AA947123 AA137146 AI347813 AA910386 N21442 N63579 AI741987 AI768933 AI187285 AA099185 AI813768 AI368703 AI636604 AI827186 AW592490 AW058122 AA421778 N71987 BE468018 AW080902 AI216787 T48695 H01514 R33324 W72293 AI671748 AI284779 AA137074 AI418731 H88426 H88413 H88364 H88354 N71975 N36426 AA884242
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134738	18022_1	AU076801 X83228 NM_004063 U07969 AW853021 AW854674 AW609640 AW753432 AW604493 AW391746 AW854701 AW854703 AW604484 AA308216 AW862312 AW753130 AA053188 AW859530 AW859603 AW859550 AW859567 AW859489 AA102326 AI733765 AW859487 AW879361 AW859497 AW351846 AI347909 AW351659 AW375303 AW375298 AW351613 AW578054 AA376878 AA088861 AI732453 AW887172 AI262603 AW375947 AI920859 AI566493 AI623483 AI922856 AA305406 AA056417 AA313526 AW950160 AA565642 AI732393 AA053102 AI688206 AI721059 AI601183

128180	27120_14	AW949068 AA557891 AW949060 AW973973 AW949103 AA650284 AA654838 M21896 AA504038 AI557338 AI547284 AI557405 AA471075 AI732363 AA588358 AA229713 AA230069 AA587730 AA230054 AA531476 AA226266 AA729111 AA554524 AA579136 AA228773 AW957255 AA230212 AA570800 AA228802 AA655033 AA229145 AA650240 AA653930 AA226143 AA579264 AA244482 AA618514 AA228761 AA533114
104667	82675_1	AI239923 BE463623 AA007234 AW129672 AI650353 AI805921 N51082 AI564414 AI241833 H52176 H52585 BE220048
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120328	167625_2	AA923278 AI341975 AI650511 AI961064 AA196979
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106096	90631_1	AW379378 AA852211 AI751036 AA657729 AI751257 AI752526 T59268 AA299257 D31528 D31541 AA319726 AA364833 BE178218 AA336003 AW173315 AW303375 AA384793 AA417652 C04206 C05155 AA455496 AW794702 AI751258 AW794499 AA600736 AA625303 AI090486 AA258414 AW795817 AW631492 AI768270 BE378218 AA599207 AI828437 AI862133 AA421744 AA419609 AA024968 AA446024 AA419525 AI272646 AI148235 AA455497 AA634323 AI092202 AI191710 AA375571 AA593295 AW957682 AA774270 N64555 AI218226 AI754332 AI039656 N67061 AI350380 AA978105 AI084698 AA912602 AI751035 AI673545 AI432010 AA610296 AI754989 AA971661 AI564218 AA478719 AI221431 AA258397 AA936765 AA456579 AW338252 AI075349 AI270416 AA410897 AW572523 AI382511
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129000	37953_1	AA744902 AI571767 AI097387 AI357779 AW583460 W39645 AW014996 R85139 H39057 AI675368 AI159850 H96718 W05585 N98881 AI038335 AA206790 AA918345 AI536671 H46750 BE350087 AW197014 Z43666 AI080414 AA886382 H98215 AI202597 C15906 C15872 D80812 D60117 D53401 D81322 D52755 H19694 AA688395 C15801 C15411 AA683218 AA991302 AI263272 AW469791 AI570417 AI114878 AF116637 D61286 R84467 H49688 BE077114 H19693 C15829 H23775 AA339499 W31186 H23900 H97800 AI267364 H46831 AW959927 AA206963 H43859 N80428 H45366 H39083 AA425373 AA425465 AA846590 AA046580 D55145 AA621706 T07073 D54657 T08681 M78869

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105500	47391_1	AW602166 H27807 AA256985 AI885416 AI424243 AA781512 AA889422 AA694242 H93603 AW339154 AW629590 AI000160 AW613178 AA256986 AI247191 AA224998 AA256485 C01115 R83652 AI380982 AA333630 AA864639 AW026325 W79647 AF086390 AI287672 W74079 AI276664 AI420272 AI342436 AI298488 N90717 AA224927 AI420762 AI666213 AW577102 H44430
105508	28450_1	AA173942 AW340361 AW051451 Z30152 AI373446 AI205868 AA877392 N77705 N55339 AI267930 AA045814 AI373456 T90642 AA189109 T31714 AL110126 AA370493 F05971 R34427 AI312646 BE044590 AI220003 AI283798 R38259 AA716749 AI143745 R46634 AA630545 AA629608 H42099 F10707 AA716649 H08738 N77345 AA129564 AA630438 AA047635 BE160867 AW953643 AA359126 BE393582 AW607442 AA256679 W80945 AA456404 N58337 BE274974 AA022974 AI186132 W26186 AI091820 AI570515 AI263997 AA232711 AI140312 AI469924 AI276475 AI129610 AI743887 AI924968 AW188027 AI130934 AI266227 AI493333 AI291964 AA455935 AI375107 AI363031 R48960 AI380788 AA047535 AA876373 AA977525 W80824 AA173541 AA661511 AA232209 AI377867 AA777167 AI492854 AA706605 AI144540 H42054 AA884059 AI473346 AI242452 AI968059 AW274832 AI671519 AW002603 AI934064 AI500491 AA876721 AW182176 AA256680 AA910769 AI382571 AA913276 AI453679 AI199434 Z38891 AI680662 AI459275
129075	10385_1	BE250162 BE296056 NM_002439 U61981 AA421716 AA723916 N32298 H99382 AI817671 AW364509 AW364468 BE250719 AW364498 AW993728 AA382889 AW473270 N44579 BE514508 BE514324 AW069265 AA969963 J00140 AW575796 AA314334 AL040147 R01547 T91432 T29009 W47530 AI242555 AI379077 AI272820 AI467802 AI827163 AI221263 AW592425 AI472183 AI740752 AW044683 BE467755 AA427637 J00146 AA252992 AI784131 AA694127 AI352150 AA290600 AI040148 AI090860 AA215695 AA227746 AI040147 AA401306 AI332971 AI187739 AW013865 AA010576 AA699792 AI131225 AA700469 R91775 AA778381 AA455309 R00884 T91344 AA682438 AW821327 AA290577 AW864100 BE397831 H25209 BE397236 AW821317 BE253372 J00139 X00855 V00507 BE252613 BE250809 BE256056 BE391734 BE295309 AA031848 J04810 AA749344 AA489055 AA129465 AA280816 AA280833 AI803332 AW572941 AW572255 AA725857 AI184392 AI635482 AI186480 AA463881 NM_000791 AA447680 AI830697 H94631 AA129464 BE071304 W23580 AA742541 AA651836 AW885001 AW026548 AI361777 AA665122 AI359154 AI039319 AA423962 AI469383 AI262751 AA134941 AI138260 AI003995 AI096798 N80705 AA292482 AI436158 AI695673 AI141920 AA932994 AI880434 AI131169 AA424790 AW024376 AA707045 AA557160 N73567 AW051136 AI419234 AI423410 AI919237 AI626046 AI359605 AI421996 AI375347 AI394460 AA426588 H79646 AA423961 W07757 AA447831 AA348708 BE566659 AA463389 AW951651 T28939 AA488803 AA307107 AA281033 AA280993 AW408089 F06483 BE541506 W03282 AA454921 N90189 AA701106 AA516401 AA578546 AI093830 AA481792 AW176093 AW845531 AA639142 AI271794 AW104373 AA834961 AA927195 AI274416 AA664231
129087	80800_2	AI348027 BE502126 AI138711 AI982983 AW873570 AI367855 AI052179 H29060 AA001522 AW419076 R60761 H41440 AW008195 AA019213 H17526 AW873111 AA535480 AI304671 AI609692 AI367495 AI141287 AW025505 R93547 AI279349 AI581275 N27200 AA872715 AA779062 AI471043 AI224904 AI017367 AA872384 AA738315 AI262559 AI742262 AI041676 R91429 AA057567 H86772 AW131262 AI241158 AA678522 AA953998 AW188581 H69217 H95226 AA976949 H56456 N72695 AA725465 H95701 AI264419 AI220672 AI290418 W57713 AW194286 R99866 H85105 AI074855 AA918031 AI864069 AI678424 H14085 AW166317 AA775239 AA015626 AA429622 AA977988 Z38375 AI000910 AI431360 AA524244
.105588	16241_1	L43821 NM_006403 U64317 Z43516 T32960 AW630081 AA311484 AA371958 AW500483 AW843734 AW843732 AA633455 AW367753 AI888130 AA322558 AA486343 BE301275 AI925674 AI084816 AI859264 AA614658 R85808 AI834268 BE220087 T85087 AW007104 N20931 AA578880 AI686498 AI566735 T39292 T39300 T39304 T39336 T39285 AW613847 AW089138 AI968682 AA493210 N88590 AI753359 Z42849 R61431 N71155 AW516368 T40509 AA064805 T40508 AA380175 AW963532 Z44251 H09381 AA279249 AW675199 AA309822 AW960657 H65178 T24972 R73746 AW859590 AW576255 AW392437 AW947102 AA447838 N40318 AA745981 N35758 AW190522 AI338165 AA478437 AI744191 AI423196 H09321 R61386 AW263144 AI627568 AI360799 AI360842 AW674632 AA279215 AI084758 AW572349 AA910809 H65122 R73663 AI091525 AW363913 AA765765 AA740549 AI536885 AA873412 AA122400 AA687921 AA814628 AW576224 AW196743 Z38985 F03394 AI864842 AI200147 N27798 AA157721 R17863
128453	21764_1	X02761 AL134153 U60067 M27589 H12552 AI750806 AW069698 H00678 T92951 AA156457 T53448 R77777 T47375 AW653325 T60421 W61256 T47700 AI752874 AA116119 AW150500 R46471 R42093 R44355 R62662 R44189 AW813264 T63601 R32764 AW069338 AW023601 AW020233 AA946739 AI752245 AW191877 D58570 AI754285 AI886146 AA342911 AI139349 AW994835 AW263386 AW994830 T65787 C18724 U42404 AW378684 AW580570 BE174525 AA600101 AW750611 AI356556 AI750644 T47699 R81772 T49245 T93048 R36450 T49421 AW390369 AA082805 BE142984 AA129277 N83780 AI370335 H43251 AA330915 R23404 AA367947 AW608529 W25319 AA935923 AA092761 H75833 R15348 AI750474 T78889 R62612 T53447 U41850 U42455 AW947480 W25621 R21374
104933	6451_1	N94126 AL079277 AW888638 T99290 T66903 AL079297 AA385535 AI904659 C01303 AI672325 N56904 AI690044 T66879 AI459242 AI984028 AI824050 AW150708 AW292114 AI761229 AI744400 AI076075 AW338738 AI473882 AI866270 AI864510 AA148594 AA515264 N69305 AA812099 AI040500 AI367728 AI803898 R40374 AI916038 AW192082 AI866927 AA909946 AI205640 T99244 AA767512 AA977260 AA063070 AA063098
128472	5868_1	BE241880 AU076460 BE241665 BE245048 BE247391 BE246660 AA298045 BE077209 AA297464 NM_001814 X87212 AA361792 R72967 AA360906 W24402 R66335 BE535303 AA312121 BE397079 U79415 AA305090 AA376522 AA297298 AA383568 AA297907 AA360340 BE069716 AA298339 H46642 H16271 AI142867 N90454 T80468 AA063400 AA298057 AA298101 AA298014 H66230 AW675364 H04403 AW995462 BE161688 R06023 AA295256 AW864340 AW964280 H71749 T60230 AW864485 AA461415 N39480 AA875996 AA055296 T83014 W32011 AI356625 AI697273 AW363586 AA054986 AI804501 AI955203 AI671058 N47562 AW072362 AW589307 N79134 AW474312 AW189479 AI979123 N33847 AI358930 AW131876 AW264203 AI571565 AW517706 AI702005 R33767 BE044262 AA903662 AI758808 AI625339 AI608874 AI859527 AI419415 AW769283 AW519037 AI589797 H50749 AW262906 AW803051 AW190946 AW470124 AW085499 AI151493 AI589155 AI811579 AW071433 AW043903 AA923546 BE349609 AA946567 N28435 AI027551 AI886029 AI218474 AI249095 AI827883 AI262847 AI038312 AA461100 AA516112 AW607922 AI250238 AI587647 AI445709 AA506164 AI095563 AI367751 AW022921 AA594304 AA954399 AI273385 AA644088 AI765475 AW449748 AA054987 AI359314 H04378 AI362797 W68451 N26792 AI346633 AI302865 AI344505 AI347884 AI339769 AI159818 AI191669 AA917866 AI301086 AW468843 AI346628 AI431993 AI139442 AI474061 W31602 AI554488 AI263002 H97738 AW864080 D20107 H72312 AA922712 AI718444 AA609844 BE244914 AA405503 AA872308 T60170 AW392842 AI866248 AA721249 AI274597 AI473654 AI335841 AI244612 AW768467 AI274576 N62365 T90206 R67476 AW518530 N69192 AI146867 AW510462 AA723925 AA736591 AA055178 AI826023 T56326 AA886405 N24975 AI811447 AW496812 AA632074 AI955935 AA342746 AA358975 AA248112 BE397640 AI042227
104978	71799_1	AI199268 AA088458 AA631057 AA636031 R45651 AW245042 AW250904 AW248620 R46583 AI149606 AW009855 AA577402 AW516086 R02182 AI972338 R54078 BE301440 AI469797 BE301694 AI243919 F03242 AA887808 F09160 F10267 AI739345 AW382169 BE536816 AW472853 AW083578 BE255725 AW377425 AA088457 AA364880 AA307300 BE616509 AA306659 BE617729 AW885240 AW885210 AA294929 AW250558
104986	128798_1	AW088826 AW293764 AA845265 AW771263 AI934858 AI720358 AA101632 AW151292 AI969728 BE218525 AA779354 AI783721 AW244016 AI802114 AI093360 AI420138 AW024260 F03967 AW026834 AI373133 AI335587 AI832852 W85852 R79192 AI611148
120649	201075_1	AA687322 AA642329 AI080760 AI039479 AA832416 AA807302 AA854015 AA889829 AW771843 AI608865 AI819500 AW663364 AA905058 AA287115 AW974492 AI312843 AW302499
120655	37998_1	AA305599 AF161398 AA249640 AF116682 AI133406 N39717 AA449890 AW027019 AW027067 BE145690 AW027058 BE176728 BE176732 AW024795 AW901295 AW024324 AI869647 AA287306 AA480978 AI570577 AW602318 AA772331 AI151440 BE174451 AI469975 AA827541 AA362212 AW964222 AA983471 AA639458 AA287347 AW439509 AI866765 AI216331 AI224047 AI868763 AA658562

120689	88984_1	AW134519 AI890121 AI675294 AI338111 AI200103 AW993754 AI811317 AA731663 AA731664 AA974904 AA291168 C75353 AA730560 AI810299 AI438987 R22198 AA143793 AA101252 AI583182 AA216611 W31626 AA857679 H99145 AA020980 AI768078 AI862828 H43598 AI866902 H97045 AA465732 AA733134 AI628409 AI581618 AA494109 AI819116 AA176112 AI472513 AW614605 BE045533 AI478195 AI671411 AA581997 AI628367 AI830602 AI394104 R77963 AW576849 AW881857 R22252 BE220138 AI697987 AA026878 AA327229 AW964784 W32118 R78337 AA340274 AW861417 AW964786 AW369487 AW134545 AW139467 AW372198 AW363178 AW604629 AW372211 N24394 AW390678 H44639 BE547625 BE378546 AA021065 AW749075 D79177 BE003143 BE538347 AA148177 AA501786 AA465134
129113	20805_1	BE543205 AW295679 AW673574 Z42168 H67124 R76663 R34273 AI248588 BE563389 AI110638 AF063512 AA323818 AW451960 R53683 R35469 R76334 AL050159 AW952333 AA985460 N70948 W20094 AI935619 AA299214 AW022621 T87680 BE173489 H28874 R83808 AA480490 BE173429 T47469 H95166 AA385568 AW956798 W31529 AA531109 N50543 N64019 AW182443 AI278631 AI073393 AA526901 AI056406 AA147701 T49984 AI192203 N50194 AW889806 AI971390 R78690 AI956145 AA576727 BE043948 T67476 AI435353 AA256232 AI096758 AI095656 AI765375 AW889828 AW889883 AW898231 AI880696 AI361249 AI956056 AI240407 AI310705 AI660609 AI806066 AI832496 AI494103 H04356 AA740597 AI216050 AA846346 AI014665 AI038130 AA687761 AI640214 AI306435 AW664764 AI032636 AW129290 AI040442 AA256173 AA704713 H68547 R11671 H43562 R51003 H01321 AI050987 R53571 AI240856 AI192395 W04630 AA781781 H04314 AA340769 H95569 R78642 AI087904 AA147646 AI097392 AI869195 N48462 AI565369 AA910379 T50041 AA469240 D62067 AI370195 AI382557 H95131 AA225900 AA574255 AA328752 BE173506 AA782848 AI766294 Z41612 N90433 AW129932 AI269081 AW299810 AI985143 N76125 R83371 H81430 R00098 R93230 AA975698 AW023941 AA237076
106286	34552_1	AI765107 AK000557 AW250662 AW404558 AW631125 AI474992 H38495 BE259536 AA338808 AW961032 AW375527 AW375519 AA036978 T98407 AA058761 BE394031 AA366003 AI761506 AA587887 AI573291 AI744657 AA588536 AA738047 BE502073 AA700013 AW246799 T85297 AA759011 AI890594 AI148268 AI587531 T15960 AA830722 AI298775 AI200417 R00301 AI798469 AI825338 AI809308 AI436070 AW137267 AI344370 AA838214 AI085034 AA838498 AI537302 AI368583 AI040364 AI341279 AI365563 H78131 AA036979 AW082916 AI248063 AW337164 AW663937 AA683570 AW473394 AI500302 AI357177 AI927184 AI991231 AA365119 AA573353 AW630338 AW872754 AI766544 AW589264 T32118 AA719102 AI370730 AI469218 AI668957 AI263592 AW103958 AA434441 T99954
128506	19818_1	L40904 NM_005037 X90563 AB005526 H21596 AA088517
129168	20858_1	AI132988 F30153 AA330234 AW961558 NM_004894 AF054175 AW248089 AA531530 AA654862 AA216025 AA081589 T83147 AA650169 AL046957 H87571 W31005 W15644 AW967334 AA305437 AA341970 AA134307 AA134315 AI190937 AA094070 AA284212 AA953551 D53844 W30743 T84144 AA133509 AA134308 AA308101 F27405 AA134316 W30854 AA983553 AA626444 F38175 F28848 AI305827 AA468556 AA974508 AI066796 AA554533 AA548236 AA742511 AI209154 AI806566 AI582766 AA903485 AI189759 AI186311 AA569869 AW305249 AI148765 AI244424 AI144495 AA279759 AA521064 AA907836 AA552043 AI000083 AI478931 AI128403 AI200568 H95707 F30237 AI302453 N94464 AA557186 F20977 AI491886 AW183938 AA569868 AA852663 AW275122 H91807 N41841 N30742 AW169997 AI038347 AA746065 AA972090 AA654533 AA654036 AI936891 AI807215 AI332537 AA906338 AA115690 AI251732 AW975227 AL046958 AA937615 AA730937 AI420622 AA978142 AW105551 AW182041 AI363204 AA651663 AI057284 N94563 AI827188 T90621 F18332 AA707791 AA635717 AW249748 N80826 T24920 F18565 AI005595 AW592487 AI674940 AA283903 AA084667 AI674878 T89384 AA552449 AI701784 F37912 AA215865 H91708 AI040250 N98724 AI264957 BE391925 N56092 AA369378 N56408 AA092677 F36194 AW023614 AA664664 AA665052
105643	27555_2	BE621719 AI650848 AI948512 AI565989 AI701100 AI651953 AA400457 AW665046 AA132285 AI384087 AI862666 AW731708 AI492502 AI417121 AI923718 AI368059 AI798646 AI308171 AI920811 AI766803 AI288945 AA904735 AA905287 AW105089 AI914082 AA337906 AA337575 AW961108 AI890117 AI458515 BE552265 AW515686 AA282069 AI273524 F25739 AW512006 AI334601 AI475997 R36636 AA642305 AA737494 T91753 AA132264 AI572422 AW576228 AA093898
128515	5884_1	BE395085 AW938942 NM_016639 AB035480 AF191148 AW172990 BE304867 BE384718 T74424 N41733 AA386018 AI219327 AI221536 AA610401 AW859588 N83862 AW391445 AW815436 AW815444 AW815514 AW815626 AW815697 AI768116 AI492143 AA149044 AA149043 BE076102 BE076131 BE076032 F25336 BE075966 AA631934 AW204761 AI768403 AW051452 AW338518 AI800959 AW262030 T56712 AA994944 AI827127 AI568941 AI313436 R48167 AI761510 AW628237 H95227 AI718198 R33355 AA576558 AI358289 AW001699 AI796303 AI767239 AW149867 AI911799 AI004154 AI470703 AW166567 AI470484 AI611273 AI270718 AI867518 AI264959 AA970894 AA873480 AI910684 AI701259 BE275042
128530	28930_1	AI932995 BE064464 AW371902 AW371841 AI885885 BE064457 AA524113 AA721037 AA504343 AA778099 AI800598 AI693112 AI884633 AI690228 AI400990 AW969089 AW371927 AW371912 AW383562 BE151089 AW383568 BE218503 AW383570 AW371899 BE151097 AW371900 AW293095 AW292008 AA434179 AA714780 R45868 W01182 AW957767 AW119223 AI207864 W01578 AA354403 AA805177 AI613299 AW269636 AA481528 AW079101 AF131777 R60489 T81289 AA481594 BE181020 AA465433 AW808125 T84992 AA749191
112902	22861_1	AL035633 F11794 F11783 H18042 T66089 H29379 R19493 AW134660 AI299437 AL133995 AA057405 N78357 AA917450 AI002692 T09262 T65008 H29290 AI200874 AA894415 AI732887 AI791768 AI733447 AA988785 N62128 T09261 AW956936
106350	29794_1	AK001404 AL080146 AW408459 AA308006 AA311856 AW245692 AA314336 AA171604 BE255449 AA333688 N86231 BE273258 AA131058 W21555 AB020981 BE255879 BE538183 AF002822 NM_004701 AA448945 R29074 AA296834 AA129846 BE047883 AA127430 AA356440 AW965782 BE081899 BE122764 AI026942 AI885254 AI148662 AI223319 AI566711 AI589694 AW373217 BE079491 BE082260 AW169180 AW467305 AW574879 AA548534 AI209160 AW264460 AW264424 AI863120 AI827718 AI924812 AW197450 AA830281 AI827510 AA171505 AA992158 AW662743 AI630285 AA129847 AA477855 AI916064 N87720 AW002272 AA774665 AI283511 AI151355 AI285079 AA707003 AA812053 BE502584 AW002394 AA127431 AI932735 AA969143 AA033826 W86050 AA033883 AI184396 N95207 AI538607 AI214873 AW105471 AA644331 AI886966 AI274715 AI365259 AI219971 R12588 AI696374 AA449672 AI873551 AI184398 AW473393 AA442763 AI886545 BE464149 AA612786 BE263965
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129241	20936_1	AI878857 BE314866 AA373626 AW160437 AW249045 AW247563 AW249444 T35944 AW162790 AI815553 AW163007 AF177862 NM_016185 AW163690 T35507 AW163145 AW162789 AW245575 W17086 BE279269 BE295577 BE298775 AW239152 AA081739 BE546064 AW732933 AW452944 AA306955 T19160 R12895 AW248235 AW248163 AW001143 AW162053 AA837536 AI922962 T33996 AI824155 AI201115 AW083153 AI742667 AW161761 AI830108 AI924200 AI076922 AI660564 AW245321 AW247124 AI819687 AA114831 AW245932 AI208988 AA758649 AA815239 AA528116 D51617 T30432 AI262690 AI208987 AI147137 W58364 AA923127 AI192915 T30514 AA873335 AI143959 AI150497 AA812021 AI131067 AA857674 AI088664 AW026844 AI342320 AI028701 AA732838 T31513 AI090663 AI263936 AA460509 AI146489 AA938269 AA121319 T32243 AA682227 AI380081 W74345 AA037001 AA035430 AA157846 AI122814 AA076666 AA043961 AA125824 N95775 T33977 AI278876 AA844703 AI304927 AI199914 AI086895 AA865919 AI208211 AI797337 AA513350 AI081016 AA935218 AI911153 AA659746 AI621133 AA393554 AA922480 AA506591 AA632008 AA151780 AA635844 F35980 AI150408 AA662271 AA581991 AA326722 AA304090 AW168504 C02124 AA083399 AI687982 AA149372 R10687 AW007563 AA435665 AI138385 AA633131 AI311575 AI214715 AA862738 AA876228 AI365039 AI300793 AI204161 AI014694 AW363392 AW021715 T35946 R59637 T34358 T31159 T34597 AA079616 T30357 AA309738 T30263 AA310849 AA114954 H19161 T33803 H15275 N31561 Z41906 W79797 AA083988 AA339429 AA304919 R10776 AA082390 R12632 AI032249 Z38203 AI349445 AI275653 AW161226 AA436135 AW162952 AA121451 AA304897 AA043948 AA082026 AA149371 AA151779 R15250 AA954536 AW087529 R20831 N55671 BE513794 BE072886 AI929127 AA310437 BE272561 AA991963 BE540931 BE256608 AI142628 AA992004 C15158 AI918160 BE621599 AA205696 AW157040 AW250051 AW248606 AI803396 BE378918 R59503 AW162684 AW675726 AW512625 AW162683 AI879413 AI459135 AI341703 AI991009 R41289 H15276 AI743873 AA459865 AI365995 AI573295 AI913981 AA641574 AI570500 AW157362 AI359932 AW246717 AA102348 R49093 AI720459 AI858810 AI871001 AW157171 AW149373 AI818720 AA629793 AI270364 AI816494 AA628527 AA650006 H40297 AA773757 AI339859 T96425 AA687692 AI146986 AI805615 AA324146 AI571241 AI500413 AA219491 AI050833 R33438 AA912263 AA554740 AA629996 AA666193 AA508137 AA583060 AA083362 H23997 AA527418 AI928881 AW075692 AA768434 D59336 AI422921 W32596 AA037871 AA436027

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112941	4686_1	AW163034 NM_004209 AJ002309 T08741 T80472 N48923 R81887 BE313769 H20603 N46419 AW157065 H03872 AW291363 H03873 AA825164 AW104966 AA776642 AA989308 T16232 H20514 AA890072 AA878765 BE314664
105726	5801_1	NM_012068 AB021663 T71531 T67794 AA344893 H46645 AA191110 BE271163 AA513805 AA512936 T67718 T71368 D31104 AI870651 AW629156 BE207819 AA161164 AA292328 AA815137 AA994765 AA191099 AA994766 N59773 AI000315 H46624 W56638 T64935 W56601 R06908 N93059 T85073 AW390226 AA465295 H27386 R99387 H53559 AW971750 AA714781 T73635 AW381810 AW601287 AW601284 BE063948 AW601286 BE063943 BE064022 BE063949 BE063947 AV651606 BE063950 BE063954 AW601282 AA345127 AW601288 BE063945 AW392058 BE064024 AV653635 AW991637 AW393063 R99298 AI658680 BE395604 N34330 H65944 AA496253 AI769302 AW675052 AW803131 BE467506 N25046 AW872383 AI871397 AA421049 AA179101 R71935 AI658606 AW005082 AI380622 AI499815 AI087208 AI434572 AA628172 AA747921 AA987954 Z39409 BE063944 AI720657 AI796847 AI281663 AW594699 AI720641 AW137984 AI142566 H53560 AW674321 AW132070 AA777352 AI245309 AA969757 AI024020 N73650 R07889 BE063951 T67671 R06957 T85072 R07946 T54592 AW393041 AW393028 T32244 BE175298
105731	183373_1	AA834664 BE178044 BE177861 AA625539 AA235759 H13061 N50469 R70814 AA464989 AA292969 AW500304 AI935460 AI040324 AI796981 AI890157 AI949973 AI652063 AW996983 AA398376 AA557462 AI078795 AW080589 AI804213 AI887296 AA976310 AI016158 AW241303 AA364617 AA455270 AI635593 AI208885 AA235760 AW959848 AI333957 AA292711 H13268 AA701078 R70764 AA767950 N53058 AA995091 AI566674 R77646 D52194 AW770208 AI208878 AA382439 AA382328 AA587992 N50415 AA382442 AA382502 AA382393
106390	7471_1	AJ297436 H02338 AA158880 N32011 N32614 AA525838 AA446964 AI677792 AI139599 AW205435 AA640913 AI685741 AI936226 AI094278 AA548812 AI810655 AA702913 AI017464 AA630584 AI597844 AA662112 H96372 AW338346 AA662078 AA543070 AI086213 AW973274 AI221540 AI685668 AW134915 AI696731 R08364 AI391510 AI220820 AA662861 AI623123 AW006591 AI392790 AI972502 AW139444 AI686348 AI801281 AI583077 AI201402 AI674308 AI474807 AA888696 AI972562 NM_005672 AF043498
129265	27030_11	AA530892 R46439 R22993 W51996 NM_004417 X68277 AW013822 R65960 AI913774 AW014748 AI184379 AA459716 R22310 AA524040 W45617 R62606 AA129573 AA393264 AA884945 AI306629 AA045451 W94005 H01024 AA045069 W45564 AW085536 AI247358 AI799505 AA528000 AA614594 AW303637 AW183973 AI081949 AI200726 AI470067 AI741284 AI224392 AI206005 AA515019 AA688356 AI832134 AI309942 AI972472 AI685363 AI524312 AI004940 AA769912 AA988747 AI208880 AI972380 AI806713 AA938288 AA618509 AA634477 AI469965 R22941 AA573179 AI200581 AI742424 AA468764 AW054732 AI949274 AI432591 AI569661 AA398653 AI343632 AI817705 AI343633 AI762374 AI340158 AI126316 AI452473 AI305811 AI885305 AW051547 AW593370 AW663465 AW026301 AW195559 AI369288 AI761910 AI937387 AW182408 AI149453 AI685606 AI214909 AI688086 AA588279 AA845361 R66153 AA868062 AA461299 AI031838 AA771818 AA524381 AA835016 AA857094 AI200369 AA991172 AI129153 AW001870 AI808287 AI025372 AI743150 R64308 AI471928 AW104466 AI200236 AA782178 AI740595 AW665580 AA772161 R26873 AI857638 AA968943 AI148350 AI245001 AI800733 AI190594 AA922198 AA974126 AI239837 AI160915 AI274898 AI222293 R24269 AI348161 AA812960 AI923677 AI479438 AI083758 AA968593 R65836 H87192 AI199628 AA468744 AA931769 AA905596 R22200 H15820 R73559 AW044544 AA976433 AW172647 AA991246 AI952977 AI674311 AI300680 AW167720 AA991370 AI671264 AA782053 AI831017 AI214093 AA953524 R46348 R32661 H87494 H87747 AA502755 AA970591 AA994775 AA532536 AA961973 AA620640 AA781046 AA620662 AI147332 AV656322 AI497863 AA938249 AA723917 AA961371 AA614683 AI084704 AA863085 AA757840 AI369289 AI419959 AA909338 AA937061 AA652275 W94624 AA909459 AA909047 AA904783 AI635760 AI304629 AW339550 BE219181 AW044187 AI261765 AW028682 BE220133 BE465722 BE550216 AI096961 BE351045 AI832186 AI560934 AI436091 AI422196 AI418323 AW026158 AI473340 AI422214 AW139728 BE220958 AI087388 BE221950 AW204648 AW014315 AW015004 W44534 AA947314 AI151366 AW075231 AI436034 AI392917 AI769090 BE218794 AW130262 AI589205 AW051278 AI250363 AI830804 AW262237 AI990168 AI634871 AI638187 AI798152 AI698185 AW000896 AW469265 AI147840 AI783608 AI627742 AW024420 AI872960 AW300037 AW025071 AI951547 AI766009 AI768322 AW008501 AI953376 AI022876 AA862834 AI253026 AI417597 AI436621 H86958 AA310606 W44533 AV658735 H26694 H26549 AW827303 AA367151 AA385080 R48196 W21976 AW794572 AW887246 W22848 W16674 R66637 AA890723 W37557 R31631 AW754289 AW629883 AI983878 AA296041 AA652782 AI956076 AA148831 AA151060 AA149094 H21593 AI110578 R68734 AA312698 AI278791 AV646518 AA528324 AA483050 AA013389 AV662286 AJ227912 AA100643 AA534962 AI950801 R79387 H04421 AW029283 AA150767 AW960232 R24508 AI342111 AI354486 AI805249 AW152250 AI954157 AA708746 AA885522 AW571463 AW136888 AA367810 AI376297 AA554532 BE122873 T27641 R28260 AA149095 AW273246 AA630085 AI205165 AA843403 AI538988 AI148236 AI445086 AW304213 AI718052 R68681 AA576126 AW272437 AA947429 AI721016 D25598 AL079997 AA736640 AI653854 AA018197 R26087 AI803803 AI151476 AA342527 H85646 AA953048 AI051042 AA988506 AA100642 AA720526 AA976292 AA604926 AA875942 AA977949 AA902944 R79388 H86754 AA150431 D56509 AA628144 R67358 AA046912 AA865418 T03811 AW020544 R27999 AA381257 AI283880 AA757535 R48371 H13674 R82642 T56972 AA020881 H85864 AA018946 AA074910 AA394169 AW517919 R33499 AA074913 AA654385 R48738 AI244700 D58190 AI270427 H04395 R78941 R55504 H86908 BE243618 H86757 BE122905 AI926294 AI383760 AW627357 AI089977 AW264875 H64936 R52399 R80807 T17257 F01408 AA044854 H84908 AI540282 W90037
128610	5905_1	N48373 NM_001627 L38608 Y10183 AA262217 AW753075 N38736 AA262218 AA464900 AA464626 AI692580 R13558 AA214664 AW601683 H09189 AI752497 AA160065 AV653517 AW968888 AV660191 AA482188 T68513 R30733 N46489 W33058 AA336413 AW961079 N26375 AW993589 AA280339 F06946 R20701 R25706 BE067521 AI239631 AA837433 AI220324 AI473782 AA127889 AW968882 AI445486 AI754377 BE465326 BE503131 AI670792 AI685623 R41236 BE348349 AI439167 AW469600 AW172580 R39862 AW130015 AI040222 AA609793 AI753801 R88603 AI288562 BE043005 AI693132 AA160883 H09133 AI684835 N57440 W51882 AA482283 AW505289 AI800765 H97982 AI807890 AA156810 AA156842 AA085507 AA085490 BE348821 AI932782 AI093768 AA280417 AA214471 T23573 AI857238 AW612154 AI351946 N35165 T32021 T31992 T32027 T32022 AA894475 AA877033 AA937480 AW952613 AI285827 AA810590 AW513250 W39699 AA304516 T60647 H19723 D58092 AA160066 AA173200 AA029282 D57784 D57901 T68448 AA481804 AL041869 W55951 H16026 N47520 AA256441 N42928 R62450 AA770631 W76153 AI027075 AA855080 AA782515 AA156721 AA825251 W72486 AW189607 T31384 AA156604 AI752498 T57750 AW119056 AI431803 AW172541 Z40035 AI378630 N94406 AA523778 W73809 AI332387 H05980 N72898 AW172777 AI823902 AI753586 AA687259 AA101774 W45054 AA526261 AA719932 AI492249 N29499 AI914417 AI078799 N29839 H99250 AA025656 AW512390 AI357817 AI435550 AW270260 AA912141 AA101149 N29787 U30999 AI167331 AA814355 AA745134 AI288890 AI378398 AI075396 R38497 N38915 AI082099 AI278455 AA837745 AA256316 H20060 AA917752 AA777157 AI042419 AW117209 AA029426 T31882 AA491892 AI050952 AI184339 AI291162 AI218908 AI147696 AW439899 AI628615 AI417598 AA526236 AI186395 AA954458 AW009491 AI038346 AW172807 AW022922 AA641089 AI358995 AA703922 AA887149 AW339840 AA678724 AW001023 AI141359 AI381394 AW242676 AI424129 AW089435 D30976 AI027975 AI623932 AA888478 AI382482 AA722150 W35209 AA211084 H06029 W02984 AA523581 R46168 R14919
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105794	257715_1	H24530 BE504444 AI817593 AI480381 AI681900 AI201883 AI457347 H29265 AI168395 AW291489 N51748 AI474181 AW272366 AI918992 AI138983 AI300295 AI972632 H85951 AI873790 H57432 H40684 AI810327 AI701614 AA365731 AA365541 AW953992 AI640212 AW291292 AI539303 R58955 AA921945 AW969611
128666	94330_2	AA808466 AW408541 AW057933 AW173219 AI285317 AI285318 AI188887 T86951 AI674065 AI379851 AI285319 AI273248 AA916353 H05974 AI768137 AI924432 AI206831 AI688061 AW070470 R25166 AW663362 H27003 AW274505 AI244682 AA486436 AA131923 AA031343 AA527280 AI925940 F05052 AA970929 AA147751 AW466969 BE090800 AI986086 R27895 R24664 AA131922 AA147517 T52090 T79243 R30911 BE176703 T84523 R62851 H30605

107059	51551_1	BE614410 BE263285 AA543021 BE077086 BE077057 AW954216 AW603009 AL079372 AA829458 AI971641 AW957537 AA625338 AA216782 BE302152 AW166947 BE253374 AA608603 AA070497 AW298698 AI654312 N70010 AI805421 N70093 AA574256 AW840760 AA232493 AA740836 AI004468 AA662530 AI138924 BE222560 AA991349 AI261529 AI472035 AI351354 AW768756 AA608545 R45352 AW592971 AA480640 AA406170 AA766706 AW769108 AA614571 AA715089 R46394 AA588606 AI097444 AI630548 AF055882 T34050 Z40494
107071	179431_1	AW385224 AI024086 D63106 D62579 AA609053 AA858077 AI568799 AI904805 AI022798 AW518879 AI040968 AW663654 AI356697 AA610023 AI359240 AA971629 AI873452 W15305 N92610 AW132137 D63105 AA229060 AI363830
114292	29227_1	AI815395 AL120368 NM_004265 AF126799 BE260421 AA095017 AA478551 AL118803 Z44979 AW881720 AL050118 AW370482 AW581642 BE396506 BE382648 AW246354 BE313171 T08867 AL047548 AW297013 AW296403 H19385 R25719 H17219 T32904 AW961984 M78952 BE261945 AA450134 H74159 AI571182 BE263579 BE266986 R09913 T91440 AW364801 AA339338 AW248385 AW961065 AW793516 AW245703 AA337430 AL046424 AW246567 AI815776 AI205184 AA225658 AW297948 AW516100 AW296357 H17114 AI859217 AI214035 AW008242 BE265979 AA677778 AF009759 AA593565 AW191853 D51256 AI359204 AI973282 AI500208 AW083410 AW194193 R12563 H18943 AW245580 AW247948 AI659973 T91353 N88658 AA225572 AI927559 AI927445 AA642634 AA665550 AA678588 AI698885 D81096 AW732061 D60750 D60749 AA090561 AI817267 AW015750 AA687090 Z40715 AI674941 AA564889 T30121 AW954225 AA775443 AI865553 AI520908 AW149871 AI694877 AI435027 AA777103 AI041194 AW135397 AI597773 T30520 T30521 AI342344 AI572751 AA662525 T15863 AI985606 AI053516 AI312176 BE560905
113674	4406_1	NM_014214 BE407555 AW672705 BE538245 BE619341 AF014398 AF200432 AA054659 AA350997 R52482 BE257590 BE255436 BE540254 AA352378 AA368117 AA056721 N95677 AI742203 AI184977 AI703196 AI858501 AW190354 BE219864 AW468540 AI264208 AW088250 BE049259 BE222751 BE546756 W60101 AA297285 AW014889 AW675462 AW381525 AW513795 AW675783 AI624316 AA994724 AW468646 AA744893 AI986396 F32627 F28856 AA056571 AI948591 AI934929 R52483 AI291300 F37406 AI673625 F34593 F22307 R42685 N66051 T96137 AI241140 T79151 F34848 F28689 AI904247 W61362 AA027948 AI015559 T96374 AA297793 AW572361 H69939 AW779474 AA812902 AI266392 AW194846 AI765896 AI636703 AI915311 AA731935 BE222765 AI452567 T33938 AA595049 AI890260 AL079610 T17216 BE620004 AA056470
105811	71767_1	BE617695 H53446 AA337307 R84598 AA336843 AA336805 H30706 R89516 R47841 AI904928 AW510845 AA526070 AA888053 AI885168 C15349 C15673 AW880940 AW881264 AW882124 AW769062 AW884194 AW882123 AI991953 AI626102 AI335884 AI990989 N34316 AA837994 AA552509 AI401049 AA480481 AI912336 AI653454 AI285288 AI955194 AI554150 AI090803 AI888215 AA595258 AI469648 R85487 H53447 N44209 AA916251 AI690777 AA577010 R49981 AI435882 T36285 AW769431 AI004435 AA293626 AA480480 AI400085 AA991155 AW519306 H38297 AW769088 AI833056 AI287574 AI869239 AI769037 AA394121 AW081575 AW661888 AI284876 AW085042 AI673603 AA552555 AA292365 AI721236 AA687930 AI934050 T03674 AA552171 AA922388 AI582103 H28136 AW137358 AI568122 AI220138 AW001520 AI419713 AW301098 AW301080 AW009642
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128789	242173_1	AW368576 AW608042 AW608060 AI698134 AA485294 AW022298 AA486666 AA344857 AW838572 AA345513 AA486567 AW293657 AI085802 AI814184 AL048262 AI087838 AW269513 AI830641 AI627296 AI762868 AW379562 AW471021 AI817002 AI092496 AI800669 BE465358 BE467033 AA721711 H62838 AA721758
121503	174478_8	AA412049 AA399074
107129	4002_1	AC004770 W05005 AA356068 AA094281 H29358 T56781 AW875313 L37374 BE312466 BE311755 BE207106 BE293320 BE018115 AW239090 BE548830 AW247547 AA776062 BE397382 AA486713 T10111 T09340 AW498981 BE547280 AA356003 AW581520 AW875331 AA580720 AW875336 BE276873 BE408229 AW188148 BE255166 BE253761 AW793727 AW373141 AW581548 AA471223 AA305950 BE263976 AA626820 BE257409 AW360962 AA090655 C00312 BE312741 BE407213 AA209352 AW298199 AW248553 AW297794 AW731722 BE300586 AW731972 AW615446 BE301599 AW615520 AA486714 AW440257 AA196516 AA564630 AA618079 AW192592 AW474985 AA604580 AI627461 AA765440 AI680394 AL135548 AI683224 AI581126 AW245096 AW194154 H29274 N70363 AA629758 AA580602 AA862006 AI863841 AI097667 AI928583 AI358774 BE243487 AA620553 AA653297 AA292690 T10110 Z38906 AA908544 AA340930 AI185438 T03328 T28844 AI687010 AI864965 AI872575 BE388740 T56780 AW373138 BE258717 AA699671
120911	168897_1	AI189754 AA372041 AL044946 AA653367 AI472490 AA204752
114394	20102_1	T34462 NM_016588 AF136631 T32644 T31288 T31751 BE296947 Z41921 BE562701 W92054 T08180 R51118 H17989 AI807092 AI765692 AI422694 AA337689 AA336543 AW135790 AA346654 AA054618 AA054521 AA054610 AA007469 BE219031 R67704 BE549718 W67749 W68029 AA054558 N90860 AW055077 AW140145 AI742041 AI742772 AI190645 W94890 AI453070 W17083 AI497992 W79385 AA007307 AA928224 AI143163 R15801 AI023751 AW052203 AI919239 AI333466 H17990 W74094 AA505684 R45609 T03721 N94819 T31814 AA054550 AI309605 AA864456 T32643 R66101 AA936245 AI203769 T08179 BE391402 R14623
113783	4882_2	AL359588 AK001821 AW160980 AW160713 R60610 R59877 H10278 AA344815 AA349679 AW937762 R51499 R20177 R20270 AI935430 N98574 AA557887 AA559968 H57311 AW957511 AI341683 H10222 R60556 N69972 R59878 AI015582 AI814829 AW515396 T33330 AA349678 AI635336 AW243924 AI371168 W19222 T17389 AW965984 R51500 AI358310 AW136265 F02645 R39158 AI269711 AW150587 F34915 AI825735 AW025929 AI989474 BE548407 H57312 C00272 AW578427 AW604365 T75160
105914	5785_1	AW245680 AW248105 AI929071 NM_006705 AF079806 AA205205 AW672807 R59883 D83023 R21285 C17926 C18579 R19531 H18546 AF078078 H95114 AI952982 T71522 AI763168 BE045174 BE045175 AI660838 AI928149 AW151260 AI826139 AI765444 BE256392 AI675589 AI928803 W38897 AA292919 AW273339 AI707756 AW206044 AW016232 AW055044 AI160785 AI149164 AI338449 AI151410 AI453079 AI745590 AI570609 AW119208 AI953225 AI356695 AW299857 AI934818 AW170027 AI934809 AW955915 AI978660 AI497791 AI364092 AI936816 AI566894 AI130953 AW119167 AA994955 N95061 AW249764 AA719323 AI200552 AI039364 AI349345 AI500281 AW731845 AI741812 AA745886 AI032009 AA628027 AI199833 AI122835 AW246013 AI055815 AI933218 AI886963 AI219115 T71360 AA976326 AA902359 AA872300 AI185503 T54128 AA679099 AI186651 AA402224 AI766496 AI672982 AI915367 AA308947 AI399731 AI801925 AI828622 AW016236 R45375 R59884 AA205163 AA424495
106590	78874_1	AI350260 AA988598 Z28548 BE615969 BE616037 AW410647 W94080 BE295816 H84543 AW629493 AW182849 AI092942 W94081 AI972761 AI744086 AI417665 W52625 AW410648 AW071747 AI076797 T35757 AI479793 AI803421 AI005195 AI375750 AA456665 AI827403 AI192342 AA745830 AI096465 AI362083 AA968430 AI079812 AI276080 AI309279 AI934890 AA649155 AA885011 AA525841 AI309206 AW081737 AI918166 AI802432 AI017501 AI298589 AI302399 AW072907 AA665056 AI305216 AA961542 AA769751 AI274718 AI299711 AW087546 BE172780 AA769250 AA383287 BE465779 AW954068 AI742103 AI219146 AA884500 AI668953 AI670703 AA975981 AI630943 D25769
105953	31475_1	BE410556 AW029110 AJ272057 BE294818 BE294879 AK001248 M78740 BE269104 AA099795 R13768 BE391355 M78739 BE222168 BE272244 R48417 T78577 AF050158 AA114272 AA319781 AI828701 AA369923 AW007503 H71115 AI692370 AA405292 H00411 AA113208 AA580475 AA441914 AI076756 AI690821 AI369797 T24095 AA514779 AW016331 AA731775 F24846 F35784 AA405293 AA431140 AI243672 AI745565 AA432159 AI223089 AW327585 AW273493 AA369922 BE243391 AI598237 AW086438 AW188208 AW440968 BE464350 AW090654 AW088435 R91137 AI799806 W84581 AW235828 AA913249 AW050992 AW327540 W84580
130080	23940_1	X14850 NM_002105 AW403571 AA252011 BE612408 BE296104 AA287562 W32583 BE278606 BE408067 BE621198 W94174 BE409472 BE409450 W68240 AA293578 AA452974 AA402261 AA425209 AW403349 BE019334 AW402498 AA252266 AA490804 AA641976 AA404737 AA262121 AA641739 AA252330 AI346416 AA410550 AI127894 AA286894 BE266359 AI660653 AW673673 AI739476 AI052545 AI246051 AA425654 AI934493 AI304325 AI992278 AI368129 AI375393 AI401570 AI741839 AW043867 AW977266 AI150741 AI368127 AA814875 AW075943 AI954049 AW134990 AW574780 AI143329 AI318105 AI283241 AW575172 AW081161 AI142073 AW016427 AA741381 W63774 AI346292 AI141089 AI582307 AI283179 AI126730 AW043912 AI571832 AI298341 AI679483 AI521429 AI346394 AI273252 AI880039 AI383700

		AI287542 AA632199 AA448204 AI198285 AI869256 AW574781 AI349346 AA713587 AI263944 AI864900 AI273251 AW515501 AI265988 AW780139 AA909952 AA765867 AA465092 AA744588 AA731158 AA814660 AA748723 AA768424 AA235743 AA765706 AA809967 AA632362 AA722465 AA721072 AI739477 AA806084 AI363026 AA252319 AA830765 AA768839 AA780188 AA737659 AA936522 AA251781 AA648959 AA402783 AA452833 AA262136 AA744737 AA458933 AA768945 AW016384 AI073667 AW140044 AI919463 W02122 AA227390 BE393943 AA282805 AI183859 AA830665 AI871369 AI887043 AA286895 AA594349 AA837324 AA214524 AA810962 AA287576 AA490613 AA825316 AA613373 AA761522 AA731427 AA767785 AA733191 AA948512 R32626 AA251671 AI860358 AI424667 AI493334 AA481488 AA252351 AA731499 AA399475 AA737005 AW137326 AI824260 AA465210 AW247312 AW368898 AA302102 AA256564 AA912888 H24558 AA604467 AA252929 R23909 AI572501 AI858741 AI130884 AI538528 AI288244 AI991619 AI131338 AI379888 AI810139 H18623 AA523536 AW517344 AI279546 AI144242 AI379684 AA573326 AA479696 N23081 AA397812 AA262774 AI186536 AI222012 AI192712 AI818719 AW071697 AI805329 AI871755 AI192609 BE220626 BE219396 AI633555 AW104172 AA577335 AI827811 AW007345 AA625830 AI588989 AW770682 AI148337 AI475084 AI123923 BE550812 AA662467 AI360115 AI805170 AI369687 AI193722 AI282176 AA972427 AA236915 AI336153 AI086426 AI222895 BE549696 AI123934 AI085689 AA235489 AI273579 AA564468 AI239466 AI298426 BE220634 AI417179 AI669072 AI187330 AA252247 AA434251 AI342328 AA477824 AI167911 AI417106 AA961041 AA642406 AA233129 AI082559 AA700492 H41441 AI190068 AA854589 AI279528 AA766145 AI580054 AI193551 AA860764 AA897119 AI143445 H40029 AA242933 AW772475 H41460 H95392 AI825262 AW303587 AW274048 AI962152 AA811134 AA948456 AA402162 AA292269 H81731 AW007786 AA570126 AA928634 AA402817 AA284933 AA410695 AA714511 AA478223 AA197317 AA830632 H22464 H51429 H95424 H81730 AA292963 AA262854 AA456794 AA937842 H22504 R23908 H21208 AA836312 AI090132 H40752 AA233697 H40751 AA256563 AA290819 H41014 AA838308 H51472 AA773829 T77989 AI288232 AA443907 AA025611 AI363870 AA293048 T27807 AW403778 AA224587 AI033349 AA496418 H18622 H30359 AA386273 AA386272 AA682686 AI827574 AI554793 AA760862 AA760859 AI816990 AW731660 AA811889 AA806839 AA767410 AA536051 AA287575 AA481173 AA465623 AA455243 AW950018 AW949942
128896	415_1	T53925 AV654499 AV657714 NM_004467 D14446 AV658061 AA370274 AF075361 AI110862 AA345505 T74363 AA188651 AW297483 AA345286 R10477 T85969 AF114088 H65999 AI174708 N72345 AA776481 R06022 AV662188 N92084 H58205 AV662210 AW665010 AI248425 AA677287 T73668 AI193644 AA693775 AA188754 AA676216 D12418 R05924 AI242950 T86984 AI868468 N68870 T73568 H66000 T28575 R10378 N92944 AF042036 T72498 AI444654
130094	26139_1	NM_001471 AJ225028 AF099148 AJ012288 AL031983 AJ012185 Y11044 D80024 AL119755 X90543 AI598214 X90542 AW380842 AW380854 AW380862 AW380861 AW380836 AW380767 AW380855 AW380765 AW380851 AW381524 AL042317 AA348199 H51356 H19658 Z44106 AW867915 BE181406 AW896205 AA181004 R71844 AW373750 AW373775 AW373673 AW373686 AW839098 AW373772 N56175 T81224 M78726 AI741552 H43286 AI371087 AW090617 AW264022 AW081493 AA348198 AI668882 AI435011 H19659 AI078526 R76486 AI808509 H41556 AA992062 AI242458 R71794 AI280436 AA742280 H50397 BE047768 AW517824 AI866545 N70841 AW263371 AI377521 AA908707 T81014 AW380864 AW391804 T99207 R73356 H25821 R76485 W01458 T99208
115084	10376_1	BE383668 AK001480 AA148764 BE612465 N29908 AI863707 AI803462 AI984336 AI244784 AI202881 AA101937 AA160974 AW672908 R70272 BE502676 AA076294 AI694452 BE466032 AI634396 AA127707 AA317157 AI431745 AI479348 AW298074 AI819738 AW779732 AI636201 AA127644 AI879529 AI929217 AW967042 AI979011 AW999434 AA160975 AI193979 AI261728 AI611182 AI220151 BE041823 AI808476 R70235 AA829482 AA923724 AA101938 AA479944 AI038574 AI037902 AW772390 AA927845 AA148598 BE504061 AA255566 AA291116 AA905133 AA600243 AI580425 AA256550 AI871555 AW028167 F08651 AL049246 N87182 BE172825 AA661699 AI885987 AI684650 AA199704 AA451615 N29043 N36739 H96228 AA417612 AI911722 AA831277 AI218343 AW182865 W79896 AI927944 BE617134 N26100 AI458582 AA332639 AA808190 AI148566 AI016593 AI262141 AA298989 W78011 N20666 W70001 AA837014 Z39634 AA847214 AA969699 AI572503 N44140 AA450212 AW994671 C00243 AW651724 AI909061 AA206767 AA357059 AW959266 AW501282 AA625313 R76944 AI075024 N83752 BE176339 AI909022 BE219994 AA251651 AI701394 BE535538 AI310331 AA659124 AW020486 AA278712 BE537837 H46637 AI632755 H44674 AI627794 AW779883 AW675586 AI417161 AI521744 AA884469 AA448566 AW514918 AW276033 AI978767 AA449711 BE350283 AW301187 AW511119 AW194437 AI991555 AI051324 AW271236 AI168827 AW673185 AI942281 AI168428 BE179474 AA743631 AW967659 AI569095 BE172268 AI281481 AI859112 AW292479 BE041813 AW075626 R58686 H98013 AA433890 AI953954 AI624812 AW591031 AA173614 AA825772 AW518673 AI678624 AI198635 AA865892 AI689529 AA251550 AA452248 AW593588 AI216855 AW243391 AI205697 N66362 AI918718 AA854270 AI570307 AW151445 N36135 AW959355 W70000
113803	37976_1	AW880709 AW299730 AW242583 H00775 AI479289 AW299787 AW192551 AI566742 AI459679 AI889230 AI983099 R76873 AI679576 AW168845 AI478838 AI399741 AA525911 AA707181 BE049625 AI004255 H16793 AI078326 AI805808 AW299399 AI687323 AI680013 AI624570 AI193114 AW193492 AW591118 AI088396 AI554160 AI476388 AI860582 AA126669 W15544 BE049628 AA845559 AA862493 AI061081 W42789 AI679592 AA985263 AI889586 AA953324 AI924475 AL047591 AI187008 AL047590 AA505452 AI589312 AI923561 AI640475 AW166735 AI245398 AI076257 AI879857 AI565433 AA643547 R93003 AA630199 N68638 AA610614 AI061082 AI365007 AI185613 AI089598 AI632050 AW472823 AI873642 AI565888 AA370319 AI275678 AI969207 AF116660 AI114821
107252	144520_1	D60745 D52450 D52669 D60886 D60742 BE545209 AA147290 N47211 Z28667 T24540 AA379681 AW954513 N80340 H69538 N64633 AI478640 BE504487 AI608780 AI031931 AI950473 N79962 AI457151 AA625540 AW297097 AA780347 AI659003 Z19752 Z28668 AI400953 N64544 AI354671 AW197824 AI079956 AI783689 AI079934 AI269572 AI206541 C00535 D59840 D59971 D59919 D60741 D80436 D60744 AA912149 AW628867
113816	437168_1	H46008 AA757630 H45998 H47035 W45499 H18092 H46080 H46068 W40422 H18132 H46498
106639	7493_1	AV655272 AI382139 AI124646 AW298134 AA652260 T58540 AI337943 AI354941 AW511303 BE501483 AI371627 AI687503 AI693430 AI693871 BE348647 AI091164 AA947682 AA371477 AI014595 AK001478 AA319342 AA775305 AL119130 R13701 AA363659 AW959490 AA460066 T95465 AI161400 F07057 Z42134 AW298014 AA134238 H15216 R19551 AA356614 AW965786 Z43860 AA448444 AA133248 R09023 AA011707 W52631 BE539194 AA404459 BE540061 H77582 R65897 R82856 R77316 R07005 N76954 AA151044 AW237218 N45210 AA602932 AA602716 AA133302 AA758224 AI934546 AA777775 AA313088 AI090189 AI034208 BE179566 AW243921 AA094482 AA503364 AA150954 N55569 AA459974 AA876807 AA877039 H15156 N50021 N59869 AI359768 AA011659 AI082642 R08917 AI057486 N59861 AI159893 AI373105 AI421080 AI342277 AI627170 AI291327 AI248158 AI248401 AW243833 AW302479 AI359914 AW304855 AA134239 AA700701 AA778115 AW590251 N93112 AA523791 BE328612 R77267 AI685130 AI624648 R65802 AI094830 AV649450 AW197384 H77583 AI554805 AW169702 AI018035 AA719149 AA923007 AA522740 Z39926 AI967947 AW002934 AW242790 AW594430 AI471090 R93133 F01671 R37796 AA879223 R82857 AW297212 AA522866 AW014397 AA935208 F03335 N58316
106654	45790_1	AW075485 AW172725 AI139839 AW016792 AA884849 AA864855 AI074623 AI971498 AI015679 AA460449 AA770565 AA486285 AI743010 AA135421 AA599969 AI827576 AI280003 N51411 N93321 AI033354 N39592 T08378 AI362995 AA706143 N67186 AI914762 AA776948 AA489379 AI582816 AA630687 AA612847 AA604912 AA877918 BE250407 BE089982 AA599941 AI284644 AI244178 AA847692 AW103367 R39987 AA535348 AA195482 AW673066 AI277886 BE465702 AI248419 AI285130 AW166948 AA573153 AA025800 AI183794 T08907 AW627396 AW088806 AA192412 D16935 H17298 AI886836 AA181649 T79405 H11014 AW245363 AI539823 AA922299 AI252815 AI359568 T03411 AW189837
106689	166691_1	AW296584 AI148476 AA830427 AW274632 AI743693 AA463272 N27950 AA243863 AI435319 H97988 AI858382 AI652245 AA934726 AI524315 AA283019 AI431707 AI081819 N62389 AI124890 AI828768 AA918069 AA644278 AA602331 AW300062 R44785 AA481312 AI698918 N26029 AI990803 BE504851 AI830530 AI264927 AI379553 AA195654 AA234974 N67908 AW514546 N40392 N59013 N40716 N79356 D79707 N55407 AA236195 AW970965 AA233081 R44415 R49013 AA515611 N45671
129565	22779_2	X77777 NM_004624
130117	5921_-6	U06641
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130135	7730_2	AA311426 AA121371 AA114214 AW498646 AA351817 NM_001070 M61764 BE619846 AI810820 AI925931 AW189057 AW365287 AI858990 AI197888 AI221058 AI269259 AA114177 AI271946 AI655305 AA830364 AA121361 AA857294 AA628775 AA609451 AI246739 AA493146 AA449220 AI261530 AA918335 AA480655 AA255578 AA716045 BE206558 AA828411 AA864423 AI128080 T77733 AW365297 AI139593 AA665796 AI200431 R49038 AI680375 R56440 N92854 AI343939 AI373574 AW003083 AI660758 AI744469 AI339832 R42481 AA824525 AI337024 AI885656 AA400182 AI870955 AW236018 R49068 AI193261 AI004430 AW090097 AA045552 R08801 BE245481 AI819653 AI301689 AI028729 AI867219 AI571384 H77660 R83857 T78017 AW304199 H54282 AA810146 AI208198 H66693 H87155 AA654271 AA810147 N47968 AW135071 AI925926 AI620421 AA887714 AW378844 R33008 AI825098 AA535373 AI375189 BE614215 BE613460 AI886603 AW015522 T78339 AA551679 AA934637 T89970 R45984 T89334 AA255618 H48520 AW275053 AI671890 AI633271 AI627426 AI586954 AI656141 AI873091 AI342499 BE466834 AW365290 AW379133 AA412154 AA281077 AI474805 C01734
130149	27252_1	AW067805 BE541584 AA306062 NM_005956 AA070303 J04031 BE312280 AW732457 AW503643 AW160327 AL121244 N83260 BE280875 F07914 AA633577 AA191328 AA314240 BE251948 H10778 T50852 AW673457 AW951060 AA306935 BE259246 AA188726 T39294 R11375 R09358 AW130512 AI619438 AA554969 AW386097 AI885437 AI609985 AA989366 R10672 T84718 AW167464 AW162292 AW675779 BE208814 W72174 AA877847 AI280980 AA653627 AI498020 R73302 AA070219 AI127974 AA747737 AI348140 AI128094 AA855156 AA995409 AA847280 T91855 W79427 R72842 AI871107 AI308940 AI300435 AA188564 AI760179 AW067986 AI268893 AA948506 AI056081 T50697 AI174584 AW131532 AI762639 AA776216 AI203778 AW293866 H10779 AW068193 AW388112 AA781203 AW440839 R09242 AI913678 R14873 AA721106 AI865494 F22283 AA569882 AA764727 T91072 AI262978 F17222 T03579 D12225 AA598833 AI582459 W76460 R49780 AW627960 R10673 W79327 R49826
128959	20608_3	AI580127 AI800539 AA235117 H05805 AA869002 AA886870 AI797540 AI123740 D79791 AA885898 AI768399 AI333984 AW664874 AA128334 AA278483 AA961059 AI382103 AI937434 AA653690 AA934911 R81196 AA652315 W23609 AW952397 AW965860 AW393401 AA418277 AA136349 AA305525 AW393414 AW610096 AA235225 H06098 AI583185 AA278957 BE439716 AI758772
130173	24209_1	U38847 NM_005646 AI300003 AW169926 AA830228 AW998285 R50615 AW296351 AA313376 AW387767 AW389642 AW389660 AW389664 AA300785 AW389381 AW389361 H60879 H99890 AW176504 AA436765 BE169286 AA367148 N58675 AI741939 AA319787 AA714641 AW467084 AI628831 AI986341 AI986353 AI582175 BE502875 C15414 AI150028 AW130279 AW173482 AI697143 AI700127 AI912354 AI890195 AA173224 AW770681 AI683138 AI702183 AI570149 AW513881 AW129049 AW664244 AA777669 AI762730 BE349576 AI185139 AI312769 AI335351 AI811587 AW515869 AI611405 AI611404 AI955345 N54151 T79602 AI500593 AI273389 T79578 N75526 AA768440 AI168020 AI801736 C14310 D51562 AI026660 AI873986 AI079700 H99891 R52969 AI914734 H10654 AA749201 N62244 AI214876 H80880 AI354872 AW291419 H67903 AI623992 AA705596 H53300 AW008758 AI914113 AI094478 H07144 T92042 AI381266 D51093 F09534 AI470628 AI128792 D59532 D25590 AI207613 AA359818 AI538959 AA323115 AA322879 AA838178
128987	20632_1	AI339046 AI275145 R53342 R50891 AW936150 AW936176 AW936165 AW936146 AW936167 AA827713 AA971922 AI209089 AI223019 H82579 H16530 BE535743 AW936061 AI751447 AA026573 AW296214 Z44411 F05916 AW953227 AW403893 AW590566 AA350089 H38073 AA642033 N73355 AI630444 AI630593 AW608717 BE168107 BE064507 W42550 AF131838 AW403365 BE084515 AW803021 AI090600 AA459821 H27054 AA326253 BE538474 AA292615 BE348667 AA744747 N28710 W60503 BE467678 AL120648 W38658 AW085263 AA765645 W79406 AA463813 AA150876 AA025284 W03467 AA025509 W56251 AA121005 AA251900 W72220 AA046864 AA652737 AA460117 AA046616 T87823 W77964 AW770864 AW340730 AW274012 AW274585 AW375893 AA838074 BE044582 AA865270 AA758578 W37590 AI093268 N49501 AI809015 AA576920 AA715298 AI469964 W79519 AI359261 AI215777 W44726 AI090504 AA115937 AW779054 AW069815 R45694 AI091875 T71930 AA575900 AI262012 AA195169 AI090622 AI081436 AI086990 AI086986 AA553947 AI688371 AI066619 AI301033 AI025326 AI687571 AI129737 AA666117 T33329 T73883 AA025323 C02044 AA778035 R53947 AW882808 AA935141 N87493 AI263263 AI186363 AI671927 AI811977 AA731247 AI480217 R50774 AA252057 R34874 AI305238 AI358639 AI089304 AA810051 AI751448 T47322 AA150749 AA082082 AA460249 AI798193 AI963475 AA580432 AI610212 AI911053 AI216841 AA749453 AA730902 AA195269 AA863123 AA461469 AA971960 Z32875 AW970342 AA994639 AA743723 Z38836 AA459701 AA838079 AI471442 T73794 AA970479 AA872546 AI269403 AI202176 W42435 AI829322 AI659000 AI190243 AA534925 F03512 AI003577 AA443607 AI027078 W37485 AA055476 AI381856 AA025818 R39020 AI349563 AW592309 AA284253 AA780143 AI216601 AA926781 AA665590 R15006
121748	251592_1	BE536911 AI015982 AA707645 AW662200 AW001937 AW027095 AA774231 AI081570 AA810133 AI623723 AW130102 AA629353 AI038782 AI208694 AW197999 AA421171 AA812475 AW295098 H89015 AA383718 AA357223
114530	104600_1	AA801038 AI620259 AA053027
114542	18581_3	AW970128 AF038452 AW363691 AI922323 AA777025 AW662423 AW972374 BE042577 AW841224 AI859211 AI192986 AA470471 AW192135 AW571539 AI913866 AA055768 AA503343 AA514607 AI924498 AA506763
113923	3869_1	AW953484 T09475 W16491 AL133118 BE017986 AA496836 AI750502 BE549107 AA359865 AW959704 AA463418 AA452504 AA378409 AA328156 N24393 R55375 H39596 AW879019 AA479551 AA363023 AA358275 W30769 AK000690 AA496878 H25985 W79868 W52767 W80872 AL365371 H98040 AA367475 AI863187 W21074 BE169312 W58424 AA115338 AA150031 AA115298 H97338 AA411955 AA687480 AI174530 W72509 AI741325 N94422 AI688227 AI687489 AW515631 AI925664 AA461615 AW513548 AA563582 AA582573 BE349263 AA569395 AA834079 AI095261 W72139 AA807844 W52661 AI752480 AA779677 AA926794 AA024450 AA988617 AI567500 AI280806 AW273442 AI142563 W02690 AA150123 AI362861 AA553678 AI081428 W74236 H99144 AA477651 W77880 AI312661 AI028169 AA024802 AI298150 BE328724 AW662231 R40403 AI952450 AI037968 BE351012 AI198327 AW004736 AI087245 AW872846 AI870989 AI334346 AI689546 AI349417 AI332748 AW166280 AI357863 AW104147 T32290 AI979074 AI917258 AA461442 AI536791 AA577352 T09474 W80763 AA987427 N79974 AA187662 AI611160 AW770276 AI201782 AA888165 AI918172 AA411956 AA935961 AW768993 AW074526 AI635472 AI612934 AA478489 AI371307
114598	113800_1	AA075801 AA075485
106753	184227_1	AI656166 AI350418 AI355271 AI628890 AI628902 AW291921 AW516418 AW612512 AW206730 AI609136 AW450906 AI928342 AI418296 AI810254 AI401797 AI968486 AA449733 AI335248 AI216435 AA476944 AA477121 AA477055 AI972539 T23913 BE222184 AA595001 AI800322 AI612791 AW519286 AA236726 AA976561 AI969887 AW780016 AW473179 AW074828 AA292470 AA858060 AA608660 AI687633 AI339380 AI206912 AI811358 AW440338 AA931265 AI439148 AI203022 AW593924 AI204178 AI208856 AI419422 AA724031 AI979283 AI202715 AA477368 AI206876 AA460792 AA448589
129626	58648_2	F13272 F13273 R34445 AV647250 BE082008 W19736 W67837 W39444 W44710 AA368308 AA367353 AI089325 T57082 W69088 W67973 AI090480 AW960154 AA807829 AI460130 U48354 AI708050 AI923927 AI810345 AA112633 D25913 D45480 N68138 AA324910 H57121 R38184 AA640108 N56445 AA025514 F11092 AA493903 W95383 W56152 AA367581 F10871 U73507 N46793 W79760 AA447410 AW945296 W16734 AW945337 AW945335 Z41375 T64536 AW945349 AI304372 AA915983 AA447411 R63583 AI334106 AA553997 AI890637 T94632 AI140098 AI192841 AI368815 N40935 R82052 T65959 N70067 AI092317 W52768 W52662 AW371136 W79670 AI700115 W15352 W74132 F34815 AI033747 W95384 BE139634 AI951289 AI051369 AA025422 AA664205 AA664064 AA861945 BE328556 AI028079 AI193663 N89993 AI698848 AA002155 AI695630 AI911625 AI193944 AA878472 AI382314 W32249 AA778270 AI472493 AA854747 AA026061 N71222 N22176 AW945339
106774	44046_3	AI216748 AA934429 AW135031 AI658617 AI686168 AI005676 AW275800 T79465 AW501146 R41671 AI989757 AA705657 T58684 AI285567 AW503040 AA478112 AW407946
129642	6175_1	NM_001360 AF034544 BE617055 AL044893 AW806574 BE312456 AW806754 BE313736 AF067127 AW068650 AF096305 AI903797 AF062481 AW248123 AA160454 BE390816 AL118630 AI878957 H09710 AW806469 AW580431 H04989 R61101 BE537695 AA282412 AW939298 BE261725 AA336925 AW955945 AI026700 T67599 AW150953 BE393459 W87472 AA188832 AA683516 AA923358 AA443525 AA471295 AI285221 AA282516 AI034087 AA970494 H09665 AA678013 AL119180 AW997153 W87507 R16081 AW295514 W05001 BE393891 R88150 AA343352 AI968905 AA364447 BE549329 AI669821 AA328114 AI651819 AW006923 AI651625 AI653428 AI567453 BE502142 AA188795 R50008 AA160364 AA357609 AI685468 AW085492 AI435048 AW237004 AA429396 AA737995 AW249784 AI969800 AA398257 BE047742 AI400394 AI190356 AW027451 AI288877 N70359 BE076148 BE076162 T67482 R50345 AA070075 AA070844 AA503528 R61824 AA781972 AA599455 AI690960 AI610807 AI888720 AI200950 AI183635 AI913455 AA017353 H97015 H04990 AW068649 W87479 H69324 AI042444 AI022413 AI359110 AI370888 AA704505 AA313400 AI203117 AA775663 AA627585 AA399209 AA351881 N57922 AA464773

		AI689711 AA514515 AA302341 AA464182 AA599359 AA743498 AA566025 AA292187 N68101 AW235924 AA861245 AI192049 AI682081 F08418 R87706 H69421 AA300253 BE293240 H59653
100114	17101_2	X02308 NM_001071 BE389795 BE280876 BE271611 BE254747 D00596 BE397212 T90837 AW327374 AA397729 AW411088 T52065 AA433840 AA353074 BE546746 AA309516 AI174883 AW149605 W21187 AI954736 AI539850 AW188482 AI439193 AI140108 AA400865 C17075 BE328762 AI559128 AW514981 AW300821 AI758911 AW271761 AI655570 AA614536 AW196807 AA564837 BE538040 AA769948 AA703102 AW411089 AI478280 AA134538 AI247965 AI479879 AI368057 AI825861 AW779873 AA128870 AI479538 AA678389 AI002380 AA678579 N74133 AW079080 AI914714 AI553714 BE041387 AI860444 T51984 BE466640 AI247990 D29210 AA093053 BE042403 AA663310 AA248117 AA699564 BE535555 W86907 W86939 N84557 AA714923 H74065
100144	13999_1	AL119964 AW160379 BE410219 D13643 AA558185 AW992124 T82834 BE077754 BE077738 AL135438 T06133 AW681208 AW996263 BE297941 BE257104 BE253839 BE005960 H29660 BE005935 AA243118 AW249290 AW602669 BE515052 AA226841 AL046697 BE258559 BE252955 AW996136 AA658492 AW604418 BE258173 T99783 M79232 BE259672 BE312815 AA774904 AI799855 AA341811 BE392475 BE272462 BE314908 BE304719 AA173117 AA345770 T71525 BE514931 H72789 AA113908 AA349104 BE272501 AW801634 AW955486 H29576 AA305374 AA565003 H18011 BE514959 BE314948 BE271929 BE272003 W32723 W68455 AA155872 H62693 BE272270 AI133557 AI752540 W19931 AA482423 AA460472 R66733 BE272820 AA486921 AW732562 AA150551 BE514739 H81348 AI110647 AF063521 AW880963 W19950 W56219 BE336634 AL042717 F12861 N90499 N90397 T75097 BE620272 BE262345 W40234 BE547249 AI270753 H60091 BE392291 N76889 H53330 H53324 H40265 H66248 W92108 AA489271 AA428819 AA341915 BE271759 AW966989 F05336 AA437333 AA531557 AW173783 H53896 N48225 AA287070 AA362089 N28019 R29030 AA501746 AA327943 AW994749 BE392141 AW994762 AW994756 T73126 AW994746 AW994745 AA405908 D54607 AA479601 N64300 R98916 W20481 AA333707 AA299603 AA305687 W52766 H13595 AA349028 AA482324 T60392 BE394527 H47443 AA173221 W52660 Z20420 W95248 AI620891 AI738414 N58098 AI869982 AI887935 N39036 AA602014 T67809 AW247179 AI354878 AW337151 AI761368 AI147214 AI888376 AA284527 W91979 AA699623 AA102612 AI357783 AW206801 W46288 AA948372 AA482572 AW105415 AI970645 AI597913 T94772 AW373551 AI609097 AI708368 AA405722 AA526112 N21356 W46858 AW136070 N78769 C06484 AI362700 AW085796 AA732843 AA428665 AA596004 N57822 AI307238 H96352 AW192944 AA854322 AI346385 AI952034 AI084675 AA482228 H47353 AI718548 AI739473 AW264939 AW070539 AA576093 AI802777 H60831 AI203711 R40924 BE207882 AI567244 AI207176 AA151987 AI799399 N55281 AW248869 AI638601 H13226 R98690 AI653865 AI911706 AI752539 AI567B70 AA429344 AI636540 H81292 AI655027 W45469 AI079628 R96879 AI401671 N72013 AI125570 AA833613 AW103977 W47539 AA429268 H71431 W68408 AA724616 AA719984 AI674429 H57506 AI148115 T28591 AI700654 W95151 AW662647 AI631421 H72790 AI128918 H59440 BE221002 AA947249 AA349234 W94138 AA774522 R38963 AA58087B AI867278 H75383 AA548009 AA774588 AA434105 AA989328 F10463 D29605 AA341914 AA783036 R46201 AA349227 H65321 H70321 AI240737 AI364042 AA372013 AI216668 AA304169 AW273684 AI351212 AI613322 N69235 AI695186 AI911981 AA971392 AA331312 AA613281 AA283188 R41216 T73001 AA579228 AA911984 T61892 N91359 AI185338 H41287 AA776356 AL042978 BE515138 BE394988 H87822 H58049 H71430 H53315 H70320 H75271 H60917 H00791 T87383 R13414 C00137 AI557553 BE382608 BE305235 AW994771 AW994748 BE394341 R46294 AA341543 AA349277 AI90593B T62538 T79843 R45485 BE390795 BE392234 W16625 H00536 T62613 AA085443 N99465 T61686 AA380215 W47586 AA650122 H57505 AA370066 AI905930 T27443 BE393074
100154	16656_1	H60720 D14657 NM_014736 BE567086 BE566463 BE566112 BE379981 BE566068 AW949480 AW949479 BE564672 BE565224 BE567903 AA366593 AA356557 H40371 R91106 AA330579 BE546676 AA315764 AA353277 H93720 W68219 H60726 AA723497 AI335256 AI638837 AW242317 AI192481 AI910143 AI189304 AW406665 R91107 H89485 AW406188 AI140369 AI344272 AI598250 AI799430 AW285718 AW629318 AI538961 AI538962 AI219489 AA993867 BE620012 BE619351 AA330135 AA330343 AW269704 AA631326 AA923666 AI380114 AI538955 R86943 AI199822 AA676608 AA884789 AW630936 W68220 N29873 AA614457 AW294660 AW235202 AA777983 AI538668 T28263 AI53B747 N29534 AI435635 AA860746 AI864149 AI808475 AI419616 AA897252 BE296432 BE267841 AA379911 H89831 R79298 N88180 H60719 H60725 AA352708 R39706 H40318 N84253 BE567446 AI655330 AA954784 AW105094 R36629 AI538678 AA778075 AI301288
100188	804_2	H73444 N57055 W38867 N90468 D14874 NM_001124 AA017572 W73051 F08781 D82211 R08807 C17011 C17019 AI751223 BE273115 AA295188 BE408486 AW239323 AA151224 R33056 H10950 N44786 D43639 S73906 R05567 R51469 AW798021 AW798014 AI356571 AI128041 AA371484 AI560240 AI808369 AA946949 AW118722 BE273459 AI741969 AA936864 AI264261 AI680241 AA573913 AI619441 AI338029 AI038361 AI669339 AI080311 N26013 AI280673 AI565206 AW519004 AI090337 AA876423 N20993 AL359337 AA876254 AA583015 AI023730 AA151225 AI200677 AI375398 AI375399 AI540560 AI912411 AA446120 BE077450 AI375243 AI287300 AA862425 AI283790 AA93686B AI751222 AA845567 AA844428 AA919043 AI261791 AI424089 AA838708 AI079768 N69205 AI673754 N29357 AA705456 AA470391 AI371890 W19284 AI288343 AI188919 AI073777 AI359704 AI952558 N35478 AI025714 N64045 AW389862 AW368140 AW368134 R50989 R0880B R50837 AW998591 H10951 AW951356 AW087554 R40968 AA369219 AA017304 AW089795 AI085975 AI186391 AL037071 H24761 F05068 R51366 AI886896 N92575 AI934118 AI540490 AI752361 AA886325 AI335573 R05462 AA931968 AI858024 AW070521 AI002481 AA622891 AA027780 N27217 N26931 H24806 AI302108 BE265500 N36645 BE544B92 R35177 R26474
100187	15283_1	D17793 AB018580 AL110349 BE292958 BE567235 AA412193 W38438 W52890 BE566465 S68288 AV656520 BE568206 W19989 AF149418 NM_016253 AV658223 T67588 NM_003739 L43839 W37401 F08737 F06575 T27359 F06300 AA364931 BE300124 H58396 W52052 D82112 D82312 AA366446 H73624 AW663269 T27869 AW950054 AA203134 BE000252 W84844 BE617544 AA402153 H24611 AI813686 AW842756 R27884 AA843129 AI831673 AI971401 AI279556 AI091614 W86023 AA902840 BE250738 AI041999 AA486657 AW007495 AI956150 AI859330 AA147163 AA147070 AA557264 AA557379 C75304 AI749277 AI280903 AA085556 AV654599 AI198281 AI630426 AW276014 AI056004 AA098822 AI264609 AI214196 AI911802 AA854250 AI446111 AI269887 AI222719 AI000022 AA771800 AW024597 AA936023 AA873787 AI814714 AA416778 AA838787 AI400736 N49692 AA702577 AA580221 AA916325 AI027016 AI077794 AA782223 AA854223 AI081704 U54719 AI123388 N90416 AW192013 T67427 AI261978 AA843631 AW613665 AA577219 AI127780 AI026020 AI022916 AI127778 AI023938 H95243 AA705974 AI298309 W84497 AA416896 AW069843 AA706857 AA890227 AI167684 C06401 H24575 AI089404 W60596 H58397 R92154 AI358421 AI245164 AI858236 AA860565 AI075141 W60098 H52506 W60488 W86061 F33598 H58768 AI357836 AI358255 W15361 T74050 AI824136 H75805 AA486560 R27792 C06437 W4483B T74879 AI623595 F05022 D57312 AA678168 H42372 C75359 AA865655 AA78164B AA484781 F02592 H73625 AA524157 AA725077 BE250237 AV659233 BE617020 BE568089 BE618951 AA535907 BE304828 BE567782 T18927 T74932 AA701220 AA854881 AI245341 BE566952 W39320 F06576 R95439 BE568236 AI014414 BE566762 AA872597 AI025983 AI269235 W63727 BE565876 AA772525 AI559249 T74425 T67623 AA075352 AA074850 AA084854 AA989309 AA075279 AA075335 T62735 AW997194 AV646269 T73188 T72351 AV653980 AB031085 AV645550 T74919 BE064574 BE568381 AV653860 AV659930
100199	12561_1	BE562298 D25218 BE208598 BE388561 BE388799 BE387932 BE560834 AA100612 AA100096 AA147503 AA307237 AW027577 AW444723 AI891104 AI632486 BE04B325 BE185154 H21250 H22075 AW052129 AI29B730 BE1B5524 BE21B256 AW614528 AW471485 AI190957 AI674449 AI471849 AI262311 AA100613 AI659055 AA730555 AI332995 AI766536 AA788769 AW516400 AA564726 AI524497 AI440293 AA630007 AI589107 AI380567 H22006 AI690130 H20293
130287	24547_1	AA479005 AA2919B1 AA477941 AI768117 AI742439 AI740612 NM_003311 AF001294 AF035444 AI863726 AW044158 AW084115 AI290356 W30881 R68174 AI452633 AW015740 H68978 AI309294 AF019953 R75643 AI741008 AI741269 AI188588 AI073833 AI832162 AI766545 AI129104 AI077667 AI738908 AA814143 AI337297 AI277523 AI565240 AI422619 AA293320 AA693763 H88885 AI991120 AI492135 AI281966 AI298392 AI669214 BE467215 N29541 AI200143 AI802743 BE220003 AI689894 AA9B920B AW0B4562 AA0571B6 AI222900 BE219424 AA503237 AA577052 AI802724 AA968817 AA976627 AA502313 AI306416 AI253677 AI991092 R24092 AA056958 AA113149 AA876081 AA97655B AA369394 T35135 T35140 T35134 D20894 AI611274 AI659266 AI417723
122411	300118_1	AW172356 AI223077 AA446859 AI432375 AI567144 AW274018 AI288165
121847	289608_1	AA446628 AI888258 AI334335 AI767188 AI651734 AI371154 AI370597 AA425749 AI278618 AW593395 AI803458 AA628659 AA453128 H01726
115291	22325_1	BE545072 AI540751 AA301103 AI916675 N85422 BE563965 AA327978 AI816094 AK001515 BE501319 AA279943 BE138895 AA343765 AW963051 AW082308 AI823992 AI653752 AI589007 AI816135 AI586535 BE501307 AW272765 AW242239 AA766315 AI014927 AA578848 AI354483 AI47654B AI03B579 AA973322 AA992180 AW472921 BE504789 AI392988 AA506076 AA769228 AI370562 AL137710 BE005656 AW965920

114660	685_8	AA071383 AA071369 AA083800 AA075976 AA116006 AA075667 AA085142 AA085087 AA076496 AA129187 AA122171 AA076367 AA074080 AA085088 AA084663 AA085094 AA112092 AA075668 AA122253 AA122199 AA071140
107480	13160_1	AF001691 NM_002705 AF013717 AF041004 AB011140 AW379129 BE149649 AW378873 BE168169 AW084902 AA233948 AA158208 T16869 AW372235 AA507188 AA776617 AW379469 AW372236 AW601186 AW991416 BE184815 AW582622 BE184812 BE184811 AW991619 AW991497 AA025674 AW368139 T57706 AW991434 AW749668 AW576740 AW373236 AI681156 AW749667 AW576752 AW576743 AW991422 AW991557 AW577300 AW577322 AW577319 T57667 AA888121 AI703487 AA025675 T29988 AI298486 W58384 AI680568 W58057 AI149765 AI719398 AW991633 AW991569 AW795578 AA632719 D11970 AW265400 AI914109 AA493846 AA233963 AI139713 AA157557 AW749662 T31016 AA909832 AI401181 AA586911
106849	7043_1	AL137281 BE205870 AI650975 R14487 AA922570 H11891 H29488 H29523 AI206294 AI215425 R38943 R38942 H08943 AA442674 AA306295 AW958068 AW972543 Z19328 AI863078 C02207 BE350493 AA505869 R40812 T93149 H95001 C18110 AA485465 F27445 AI433831 AA557309 AI377747 BE467304 AI139368 BE348511 F20210 AA912949 AW513418 BE327136 AI127681 AI658928 AA587053 T93063 F33088 AI922245 AA971641 AA663936 AW303901 AI537689 AI283036 AI283962 AW510432 AA708783 H08860 AI363857 AA829264 AA507719 AA829344 AI420107 AI283037 Z19327 F23412 AI678514 F30637 AI864155 AA917438 AI439337 AA485308
129726	6269_1	H15474 R52848 AF035284 F07283 F13380 R12156 T77191 R13138 R96295 AA356763 AW675367 AA343586 AA489509 AW500426 AF009758 AW341341 AI681262 BE252566 BE252163 AA069088 AA010227 AA307348 H66237 AF009757 AA084193 AA083946 AA374100 AW893308 N36736 AA319191 W76142 AW960664 N31425 AA057653 H10662 BE393342 W81053 AA126186 BE392323 AW902076 F12173 T66054 BE255347 BE251382 AA600210 BE393809 H15419 AI114741 BE391404 BE389714 AA057699 AW305118 BE388163 T89453 AW576394 R66422 AF009755 AA489510 H51753 AI497773 W80802 AA778129 AA069023 R52814 AA365686 AW953989 T97693 AI087020 AA732954 R40619 AA633539 R98686 R82999 AI142743 AI038185 H79526 H70618 W72916 R10913 AA704737 AA010104 AW674760 AA011433 AA703446 AA704480 R15088 F03555 AL041978 AA173042 W92755 AA083606 N28538 AI565712 H97486 AI912320 AI027627 AA948084 AI052027 AA432026 AI479405 AW513386 AA630798 AA633546 AA148694 AW130360 AA236623 N22673 AA431773 T65295 AA126080 AI094889 N24124 W92731 AI380076 AI384060 AW130366 N30429 AA112061 AA236999 AA664256 N26096 BE222996 AI028790 AF009756 AA148695 AI356127 AA083858 W86036 AI311581 AA775310 AI239724 AA992636 AA302659 H08702 AA083953 AI240047 H10663 AW263220 H66350 AW975040 AI056000 AA724663 AW016192 AI918300 AI422577 F09805 AI185362 AW148301 AI474974 AA657794 T74199 AI056494 AA468663 T74198 T89542 H79525 AA011652 AA314276 T97793 R82956 T78297 R10967 AA057613
106868	62559_1	BE185536 AW387821 AA581144 T10391 AI690802 AA345198 AW136974 AI275804 AI348576 AI868133 AA112069 AA487561 AW044496 AA346366 AW272367 T54856 AV652054
100202	19610_1	BE294407 AL135112 D25328 AA088354 BE273722 BE272668 BE276672 BE514674 BE279911 BE279913 AW239137 H30835 H30695 H39126 AW603879 AA297040 AA853405 AA143274 AA324224 AA102159 BE410931 AA156346 AA143737 T12211 AW178985 W52954 H19449 D21863 AW603930 R47802 R47796 R12860 AW249362 AL121190 AW675029 BE408786 AA374051 BE311815 AA315845 M64784 AA079444 BE076586 AA316113 AA374646 AA324565 AA044376 AA308362 AW951725 AW805242 AA608558 AA384565 AI719345 AW994518 AW891548 AI565573 H30766 H43768 AI813652 AA169712 AW868192 W07368 AI187907 AA247371 AI479642 BE300944 AA946886 AA617959 H39092 AA725570 AA570091 AA603074 AI073609 AW864812 AI498239 AI570920 AW769140 AW300823 AW613145 AA227722 AW338365 AA634394 AI568954 AI865816 AA622467 AA622586 AW571827 AW517726 W35243 AI653786 AI861994 H28131 AI312567 AI913029 AA565609 AW674259 AW166540 AW103808 AA579837 AA827484 AI199670 AI201785 BE536802 R38433 AA503834 AA878031 AI183668 AI539684 AW770004 AA903232 AA847671 AA617688 AA383688 AA383687 AW248638 AI476052 AW469070 AI634941 AA633506 AI192072 AA873200 AI869874 AA121991 AI707457 AI932686 AA984558 AA406517 AA995260 AA406495 AA769419 AI929834 AA406340 AW512235 AI673540 AA406382 AA284665 AI032219 R87480 AI140638 AI653882 N80241 T28549 N90878 AA826472 AI870799 AW069643 AA169166 AI969266 AA199606 AA156311 AI332993 AA223736 AA847238 AA228101 AA079349 W60432 R49952 AW474675 H28156 H28157 AA303532 AI926938 AI370126 H43690 AA834352 AA648144 AA609613 AA730591 AI274501 AW083391 AI309947 AA740393 AA280414 AW191933 AI018583 AL134423 AI367848 AA349442 AA535249 AW009189 AW000717 AA303169 AA543033 AL043513 AW069701 AI038914 AA143275 AA304073 AA688012 T23544 AA923652 AA187749 AA381201 BE122669 AA865053 AA074435 W23575 AA069978 AA143708 AA515580 AI695525 AA044444 BE378739 BE561618 BE535741 BE252119 AL045356 AW572190 H14937 BE386379 W16562 AA554183 BE275809 AW385196 U91917 AA912272 AA988289 N88262 AA187748 AW516465 AI674256 D57241 BE171390
106889	72482_1	U46258 AA173149 AA206272 AW408375 AA210826 AA342412 AI075920 AW952891 AW070942 AI026835 AW367242 AW602275 AW387332 AI915314 AW104080 AW013923 AW367328 AA287338 AA133979 AL135396 AW978864 AA934545 AA504314 AI630566 AI630392 AI630319 R23055 AA205833 AW673513 AA173276 AA287324 AI004681 AA829651 AA210721 AI376711 AA688155 AI858354 AA126774 AA836121 AA489233 AA598962 R22949 AI206140 AI028632 AA342411 AA599018 R78445 AW593702 AA831728 AW268252 AI343050 BE047778 AA628867
100235	6535_1	D29954 AW810400 N86381 T27145 AF070553 R24816 H10674 H05886 T81290 BE081440 AA347340 AW502865 W38633 BE081508 BE545197 N78187 AA354376 AW403884 AW949291 AA430545 N94238 AI827148 AA399070 AI796581 AI684155 T29848 AW949862 AW469201 W44737 R40401 AW469198 AW664344 AW192708 H10675 AW615130 AI862188 N59634 AI292183 AI091968 H90537 H42430 AI033530 H30425 AI291364 AA430546 R45548 AI274765 AA412170 AA574218 R38945 AA778459 R38811 H05779 H42859 BE018564 AI040602 AW505246 AA507084 R13015 AW503464 BE245313 T80046 H44409 AW602308 BE245345
130336	27120_15	AA535210 X07730 AA659438 M24543 X05332 NM_001648 S75755 U17040 AI525089 AI524893 AI524861 AI546857 AI525128 M26663 AI547285 AI525832 X14810 M27274 AI557591 M21895 AW973948 AW451486 AI547084 AA659534 AA639308 AA654548 AA534235 AI926979 AA579039 AA225115 AA658261 AA640352 AA229599 AA574023 AA573727 AA535453 AA522842 AA657697 AA659319 AA397360 AA654638 AA653755 AA808858 AA535185 AI826164 AA228845 AA259192 AA228999 T29521 AA557838 AI547051 AA622817 AA397452 AI936076 AI826504 AA577955 AA659391 AA650205 AA640736 AA640280 AA640372 AW957256 AA642495 AA579134 AA523902 AA631704 AA228884 AI524856 AI524642 AA657389 AA572896 AA658494 AA569560 AA640510 AA650269 AW083359 AA654754 AA420678 AA569445 AA564886 AI399713 AA572787 AA662137 AI546893 AA595295 AA216409 AA595094 AA572731 AI669143 AA594993 AA658304 AA622211 AA594942 AA613267 AA622228 AA622221 AA640290 AA541668 AA613665 AA570587 AA420606 AA594947 AA631696 AA579361 AA541677 AA244158 AA244159 AA557834 AA225529 AA564089 AA612574 AA513226 AA568528 AA658266 AI524918 AA420532 AA622386 AA742853 AA622399 AA420427 AA614195 AA177118 AA228440 AA229488 AA225114 AA54291B AA602936 AA595415 AA688100 AA654204 AA533337 AA467972 AA573548 AA650351 AA579038 AW969995 AA659194 AA573563 AA630816 AA654970 AA579480 AA658400 AA226567 AA225626 AA531322 AA229759 AA558395 AA525076 AA420783 AA225043 AA650228 AA42081B AA229219 AA226150 AA658911 AA568333 AA420816 AA513597 AA525050 AA579470 AA226161 AA226222 AA602211 AA527907 AA533137 AA230250 AA641190 AA657850 AA687931 AA397400 AA558678 AA467971 AA573729 AA532918 AA229144 AA569723 AA552572 AA809594 AA531371 AA528279 AA603973 AA533547 AA564290 AA650166 AA550936 AA525122 AA640642 AA639894 AA658551 AA531355 AA654373 AA614206 AA569669 AA244246 AA225154 AA604036 AA548289 AA603549 AA527943 AA524601 AA876387 AA657942 AA602158 AA640996 AA535294 AA603978 AA640517 AA554876 AA524889 AA566020 AA564525 AI734071 AA654743 AA225137 AA603981 AA230145 AA659430 AA605005 AA225509 AA602959 AA564506 AA631839 AA653917 AA603284 AA226430 AA225508 AA530919 AA542887 AA642067 AA653961 AA573590 AA524594 AI535889 AA535572 AA687218 AA243984 AA595609 AA534155 AA650133 AA259191 AA886140 AA228722 AA467814 AA578915 AA551615 AI547277 AA657764 AA894884 AA551616 AA522859 AA572918 AA229957 AA229751 AA531199 AA652522 AA229967 AA551461 AA532935 AA601934 AA230032 AA640714 AA535828 AI865511 AA468362 AA226298 AA469419 AA224930 AA652490 AA573554 AA935415 AA876596 AA550775 AA578325 AA602721 AA640881 AA602193 AA470345 AA470329 AA228299 AA659390 AA503922 AA548820 AA631828 AA468363 AA602725 AA558252 AA937840 AA551700 AA504059 AA640677 AA467991 AA687575 AA569519 AA468448 AA533935 AA230163 AA224955 AA559996 AA573534 AA613750 AA659184 AA468034 AA492276 AA533118 AA177132 AA578322 AA229623 AA578410 AA614248 AA604850 AA602011 AA534015 AI867619 AA535585 AA613770 AA557916 AA641176 AA578039 AA573994 AA468942 AA579411 AA657805 AA886046 AA652492 AA516525 AA652252 AA614074 AA467767 AA469019 AA886501 AA226264 AA224856 AA594919 AA559921 AA224855 AA602123 AA469434 AA579405 AA876824 AA573705 AA657775 AA633434 AA622818 AA580256 AA659550 AA687992 AA468140 AA579217 AA470332 AA468160 AA468372 AA555233 AA935098 AA46B122 AA551711 AA641183 AA229801 AA224940 AA570202 AA504034 AA468041 AA228397 AA503262 AA535502 AA886623 AA259272

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130338	35749_1	AI375726 AA375035 AW473735 AF151875 AI027284 N56147 AI969850 AI392955 AI826989 AA558979 R54959 AA613499 AA617721 AA948475 AA662409 AA903501 AI919026 AI018100 AI208510 AA948714 AF151019 AA988645 AA576978 AA609181 AI422638 BE263495 AW974970 AF161460 NM_016391 W38698 AA657709 T98093 BE387588 AA263009 AA152012 BE613491 AA157670 AA167416 BE620899 BE614317 AA625533 BE514747 AA657391 AA410546 AA081898 BE410812 BE385275 W16728 AA369472 AI830127 AI553745 AI188258 AA372444 AW954346 AA167417 AA152086 AA993228 AW084495 AW006707 AW572294 AI871025 AI088800 AW138264 AW298378 AA532375 AA582896 AW102856 AI814112 AI311113 AI554707 AA156529 AI887782 AI022141 AI369659 AI937626 AI056707 N94929 AA661750 AA715119 AA687670 AI553747 AI206081 AI199362 AI206076 AA504814 AA235739 AI150428 AA766830 AA885940 AI865620 AI383724 T98014 AA677906 AI869522 AI242483 AA884650 AI302333 AI799882 AA554885 N90127 AA401040 AI803167 AA564431 AA570164 AA888995 AA860762 AA515287 AA570106 AI760857 AA251834 AA243508 AI493645 AA465658 AA806966 AA768338 AA627255
100254	15085_1	AA452181 Z99391 D38037 NM_004116 S69815 L37086 AI381398 N47640 AA131963 R08267 AA365884 AW953999 BE464115 Z99392 AA778361 AA535082 AI352461 T92678 AI277339 AA132035 AI079285 AI078220 AA760992 AI350209 AI394159 AI393630 AI273266 AI242942 AI242927 AA948705 AW801871 T65049 AA831473 F09516 AI002601 N57494 AI208400 AI347804 AW440529 AW955732
130342	24725_3	U81802 AL134741 AA283598 AA227592 AA282326
130350	31572_1	AA369601 AA370114 BE613589 W44825 C05670 R84924 AW630592 AV651362 AV651430 NM_005746 U02020 F06443 AA282448 N47287 AA487998 AW754256 AW754257 AW178826 AW754258 AW178831 AW178827 AW178825 AW444796 AW449977 AA047110 C18759 R58104 AW806186 R61438 AA344546 AA344185 AV660602 BE620411 AA345021 AW855446 N45414 AL135656 AI346985 AW991295 AA363420 L29050 AI628246 AA295240 AI738995 AI201110 AI570810 AI937489 AI921237 AA338046 AI703011 AI912186 AI510844 AA312466 AA169649 AW130031 AA367384 AW173546 AW999163 AW747906 W38435 AA570350 BE619498 AA171644 AA171651 AL036971 N32103 BE440116 AI627325 AI380402 AI378189 N48604 AI494582 N50820 AW242962 AI280758 AI347110 AW262932 AI093801 AA047266 AI591314 AI860900 AI347039 AI935963 BE440094 AW081676 AA258153 N47868 H39794 AW611852 AI581358 AW008393 BE144688 AW192805 AI125068 AI709227 D78876 AW796010 AA916659 N86700 R72589 R72584 F02728 N88264 D20842 AI280764 AA345416 AW607652 AW627420 AA255720 AW510528 BE049565 AA371506 AW051170 AW194725 AI739058 AI422995 BE049273 AI970833 AW841868 AI698490 AI796572 AI718085 BE550421 AI640574 AI951047 AW468381 AI362669 AI984216 AI538830 AI498388 AA369993 AA169829 AA594783 AA806075 AA748507 AA169813 AI925828 AW468332 AI610668 R61393 AI282896 AI538572 AI452566 AA281120 D57042 AA169806 AA594385 AA371153
130356	24765_1	AF127577 AF248484 NM_003489 X84373 AV645706 AA857317 BE082478 BE082541 AA779730 BE143244 AA971761 AI342295 AI928195 D82209 D82512 D82400 D82182 AA081963 AA316125 T65486 R51409 T65476 F11900 Z43988 AA188083 AW455802 AV653072 AV653725 R59543 AA304478 AA206769 AA209222 AA482984 AI824012 AA768896 AW612577 AI400750 AA449520 T65401 AA211913 AW291960 AI911295 AI446344 AA814760 AA677454 C75000 R59544 R51297 AL039130 AA449089 AI086104 AA809866 AA206804 Z40045 C75037 AW440101 AW197032 AA280932 F09547 AI916155 AA743706 BE241778 AI376408 AW753161 R17465 AA359004 AW965881 AW999119 T07281 AA458503 AI224852 AA595767 AA442995 W37099 N49104 AA054374 T91894 AW299549 AI004825 AW299883 AI627839 BE538413 AI762896 AA826259 AW271632 AW518990 AI859278 AW274754 AW664423 AI088568 AA084086 AI536946 AI031603 AI672268 AI280809 AI344726 AI092301 AI678783 AI161136 AA845846 AI799760 AI049949 AW272717 AA814205 AI687186 AI564231 AI368242 AI280221 W37800 AI280217 AA780874 R42811 AI675645 AI432495 AA775158 AA947820 T93292 AA887849 T65412 N50218 D81782
130380	23719_3	AI949359 AI951632 NM_014498 U55853 AA877669 AI350831 AA594567 AA757313 BE004166 BE004172 AI751019 AA775945 AW900183 BE179065 C75329 AW176764 BE081225 AW841878 BE081243 AW751717 AW176761 AW176760 AI380670 AI150603 AI739640 AI208928 AI351823 AI392887 AI652303 AI570420 AW612023 AI380056 AI739087 AI817139 AI127352 AI760233 AI380993 AI392843 AI916076 AI962401 AW772471 AI569713 AW204685 AW206595 AW452676 AW134712 AI751018 AI638153 AI492220 BE551859 AA627523 AI343520 AA535030 C18867 AA447271 AW366490 AA448760
130385	24861_1	AW067800 AW089012 AA497040 NM_003714 AF098462 AF055460 AI474188 H98185 AI087984 AI760274 AB012664 AW068334 BE019475 AF031036 AA195455 AA497118 AA456244 AW673699 AA298636 AW068233 AA373922 AW600316 AW731682 AA463548 AW601596 BE219547 AA825343 W46285 AA223294 BE206056 AA704088 AW068001 AA463501 AW068149 W46425 AW068066 AI754129 AW166703 H97088 AA120990 AI906777 AW294872 AA126474 AA506770 AA113396 AA223369 AI908075 BE621311 R50082 AW960175 AA305041 AW601338
122512	19449_1	AF053305 NM_004336 AF046078 AF047471 AF043294 AW752982 AW500073 AW601961 AF011387 R94348 BE270025 AA383290 AW959418 AA301178 AW374428 AA315653 AI635394 AA430092 AI678046 AA885302 AI184582 AI637516 BE077207 AA913888 AA449311 BE547063 AA806242 AA446462 AW028219 AW576327 AA548086 AA694593
114795	27494_1	AB037858 AW888417 BE168022 BE297137 AI205125 BE003963 AW965680 AA349466 AA351821 AI492558 BE146202 D31580 AK001199 R45887 AI372674 AI755278 BE188407 AW840238 AA160849 AA027021 T18598 AA161281 AA143489 AI372673 D80801 AI870013 AI460100 AA158252 AI971206 AW071873 AI431911 AI493768 AI439206 AI376927 AI038534 AA678831 AI418906 AI356122 AA789304 AW150270 AI499098 T98883 AA349465 AA330631 D80800 AA158399 AA350488 AI334361 AW338483 AA351820 AA301787 AW753882 AI926390 AA702382 AA376185 AI084962 AA355373 AA102488 AA100840 AA325211 AA425180 BE392668 H50462 AA367255 N94717 AA037160 W89039 AI096627 AI750041 AA102418 AI589918 AA313505 AW951928 AW082735 AW189862 AI567485 AI590590 AI494149 AI422826 AW082999 AA043408 AA043409 AI363488 AW104306 AA877117 AA476207 AI811883 AW026405 H63354 AI992015 W88956 AI190217 AI738539 AI361483 N77542 N62261 AI359937 H41345 AA156068 AA102489 AW339965 AW083453 BE139062 AI937868 AW075493 AA654017 AI094530 AA548969 AI686221 AI961671 AI570099 AA904590 AA631107 AW770217 AW471322 W88756 AW134571 AL042199
106925	10086_1	AK002011 BE560115 BE244257 AA313857 AA354345 AA481981 AW962091 AA482086 AW440413 AI679439 AA090435 AI868537 AW089582 AW474722 AF038172 T77208 AW856051 AW960758 AW518287 T99228 AI307233 AI262765 BE002408 D81717 AA831090 W16962 T94688 R82725 N75161 AA329959 BE000997 AW471326 AI768878 AI627326 AI016722 AI985651 AA745481 AW166835 AI799250 AI658978 AI392702 AW166451 AI683838 AI049806 AI184623 R66658 AI700203 AW087581 AI022581 AA491261 T94333 AW151396 AW518715 R39449 N89614 AW340791 AI469622 AI583586 AA385922 AW954135 R77484 AA214329 T24555 AA214170
129823	20333_1	X00949 NM_006911 X00948 NM_005059 V00578 AI004059
131076	142899_1	AA749230 AA827843 AI584078 AW628529 AW294894 R44598 BE206653 AA136884 AI332945 AI025951 AI809614 AW168575 AI291313 AW631327 AI085768 H96656 AW439344 AW078937 AI656243 N62596 AA280025 AW339047 AI800241 AI094105 AI369449 BE465417 AW769001 AW051849 AA961618 Z40582 AA452517 H44386 H88601 AA454100 AI000264 AI521686 AA136958 N78362 H88600 R88383 R44859 AW382784 AI824802 AA249363
131083	7920_1	Y09763 Y09765 Y07637 NM_004961 U66661 R07883 AA347289 BE001800 T78142 AA299532 R91732 AW578245 R64082 H83086 AW889734 C17786 H63934 AI963395 H63532 AI432632 AI332325 AI334197 AI400573 AI334196 AW009693 AW014213 R49719 AW070871 AA776409 AI276837 AA677867 R35667 AW316736 AA682288 AA704433 T27014 AI040493 AI682740 AA954089 H25140 AI168466 AW796808 AA634042 AI924717 AA321214 AA677292 U92283
131084	28427_1	NM_017413 AB023493 AK001855 T27132 R60088 T51728 AA367598 AA372030 AI871469 R60026 AA099445 AA083736 AA101878 AI149981 AW015212 AI493364 T27131 BE463932 AA083737 AW594286 AA367347 W67823 AF086248 W91937 AI871137 AI932377 T51938 BE465845 AA676726 AA680168 AI419647 W94900 W67638 AA304416
129890	21128_1	AI868872 AI701282 D00025 AV659396 AA332389 AV653260 NM_000096 M13699 AA873581 AA865338 T61867 AW276926 M13536 T67969 S77464 AV661653 AV652883 H86642 AA166973 AA166820 X04136 AV661909 AA492037 AA333043 AA333248 AV650236 AV850229 X04137 AI064929 AA171809 AW950668 AV656880 AV658013 BE006635 AA172240 AA166902 AI683839 AI687338 AV648674 AA741202 AI921934 H86554 X69706 BE439435 T28653 AV649343 BE065513 AW273276 AA165482 AA171694 AI358150 AI289226 AA172005 AW827499

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100368	24424_1	D79987 NM_012291 AA339975 AW867242 T86767 AA780037 AI023991 AI022797 R21501 AA455415 AA581005 AA548572 AA248889 BE019694 BE467107 AI214569 AA948058 AW008862 AI283098 AI458447 AW009863 AA928961 AI800823 AI127437 AI268609 AI023899 AA694341 AA580948 AI816969 AA456053 AI446360 R42883 AW497592 AW497604
100372	29155_1	NM_014791 D79997 AA307070 AA436897 AA307476 AW949325 AL135150 AA461263 AI693521 AA626419 AI590871 AA587220 AA903137 AW003353 AI870210 AA460956 AI082492 AA744784 AA744782 W32362 AA768291 AI637653 AI888723 AI753377 AW134936 AA835959 AA664563
116024	17331_1	AA088767 AF224278 AA128075 AL035541 AA027926 AI761441 AI972096 AW071693 AI742327 AI377498 AI804815 AI640802 AI885001 AI921394 AA595115 N71820 AI921217 AW007283 AI467828 AI369306 AA917446 AI493698 AA088701 AA126899 AI936228 AW204238 AI039567 AI925027 BE138909 AW452945 AW135998 AA310984 AA027860 AW073519 AI537597 AA953976 AI521341 AW273569 AW050740 AA536113 AA559064 AI474392 AW135709 AA535181 AW572959 AA570597 AI905464 AI677810 AI587642 AW975102 AA424310 AA482527 N64192 AA658276 AW889117 AA486591 AW889172 AI381990 AI381991 AI673419 AI990950 AA487031 AI272934 AI150565 AA229168 AW316722 AI142707 BE222396 AA614168 AA122026 AW338227 AA632457 AI968726 AW369662 AA512956 AA541675 AA451748 AI250993 BE146418 AA122025
116028	10381_1	H59799 AF118652 AI541284 W15560 AW014738 AA452335 BE544743 AW327841 T36308 W01696 AI822071 F07471 F11379 H17884 AW967157 N24488 AI813451 AA307154 T06444 N76641 W58564 BE073341 BE073270 BE073211 AA363862 T10785 W73086 H96310 AI685717 W23637 T06445 AI339481 W42805 N54132 H87931 AI628153 AF118649 R63123 AA157103 BE546263 BE548825 AI902183 BE439583 BE171547 W49685 W73191 AW026315 AI753757 AA777016 BE220574 AA917341 AA929058 BE071872 AI869731 AI743771 AW131831 AA649050 AI830164 AA505418 AI673768 AA757060 AI982692 AW769179 AA723135 AA938577 AA626042 AA046585 AI148193 AI151433 AI352689 AW519307 AA524653 T82269 AA157126 AI362791 AA749429 AI479766 N80791 AI942481 H17885 AA927992 N51867 AA813198 AI346075 W49686 AA983587 N54561 AI200101 AI312837 T81577 AI674397 AI769929 AA877860 AI420811 H17927 H59800 AA169342 H78381 AA452112 AI002089 AA843462 AI301424 AI208478 AA046718 W42717 N71667 AA953967 AA995117 AA055199 AA635544 AI128348 AW900065 AI263939 AA649696 AA652012 F09043 AW273006 W58565 Z40527 AW016738 R58072 H78479 T83390
130466	28127_1	W19744 R46503 AI743763 BE296731 AA037137 AA355318 AA496829 N44805 AA347090 AW961673 N31086 AW996770 W68522 W19801 AA091353 AA248312 W44357 R11174 W40197 AA158267 W02396 AW274756 AW182379 BE044491 AW953369 AA354227 AI693750 AW996925 W45710 N34412 AA699614 N72570 AA058876 AA548104 N21679 AI038906 AA948551 AI022731 AI032086 W68424 N34645 AI982583 AI797542 AA714340 N35501 AI338224 AI291688 AW294908 AA702282 AA810816 R11175 AI700747 T90012 AA736883 BE243671 AA702898 AA010076 AI473124 AW182231 BE243342 AA312213 AA347089 AI767506 AA890568 R93023 AW812894 AA355137 N90004 W01662 AA491304 H83598 AA400751 R94344 Z42074 R13196 H78499 H77362 AW969134 AA284198 AA284197 AA310528 AA922068 AK000660 AI457629 AI269931 D79173 N67039 BE000260 AA688264 AA400669 AA505197 T99728 AA234296 AA031989 T18591 AW366346 AA256212 AA193119 AA345093 W01844 N90821 AW868490 AW051349 BE047080 AW151955 AA777005 AA059377 AI375089 AI571555 AW172699 AI436645 R82672 AA766813 AA031990 AI332630 AA194249 AA512994 AA775695 AW028098 AI741887 AA604274 AA805247 AA701969 AA262986 T99729 C16696 AI167208 N71636 AI085767 AI472804 AW043907 AA731320 AI367890 N64397 AA806344 AA251120 AA256155 N75337 AI334727 AA284086 T26676 AI382959 AA170845 AW779445 AI270066 AA585248 Z41608 AI193926
100387	13440_1	D83777 NM_014766 AA333003 BE004425 AL119670 AA323656 BE296006 AL118935 BE256656 AA374227 BE271472 BE296326 AW583557 AW583626 N40409 AW608433 AA324811 AA190746 AW949591 BE000350 AA350275 BE392178 AA430618 AA348536 AA366634 AW818371 AA317886 BE072912 BE072917 AA323887 W38798 AA322171 W46661 AA036818 AA309827 AW583615 AA378262 W25430 H97457 N42389 AA169692 AA364115 H42180 AA081704 AA775719 AI185130 N75656 AW006117 AA984601 AI421198 AA181467 AW511204 AA181639 N64808 AI937715 AA169219 AA088783 AA548717 AW238470 AW662116 AW166218 D51086 AI867027 AA729243 AI923221 AI357913 AI375759 AA987267 AA773569 AW500216 AA191460 AA633234 T34787 AA527048 C75239 N93172 AW129534 N33415 AJ239459 BE328344 AW418717 AI308847 H42999 N24779 AA621221 AI497806 AI418855 AW418718 AI089499 AI332576 AI039047 AW583402 AA430500 AI271939 AI798736 AA612803 AW169919 AI183542 AA843085 C05884 C75127 AW044680 T03756 AW583349 AA082053 AA877439 AI298253 AA010549 AW168981 AI372978 AI039490 AI311909 AI313396 W81554 AI582863 AI566169 AA010548 AA748398 AI092355 AI074928 AA862701 W46570 AI570312 AA582306 AI082069 AI452384 AI498938 AA953378 AA910381 AA987271 AW664437 AW583393 T33340 H50310 AI361354 T15902 AI280310 AW583343 T15989 AA995343 AA718958 AI277293 AI468250 AI860396 AI951938 AA018659 AI590916 AI383915 AI382782 AA844109 AI016130 AA812632 AC004912 AI091734 AW893561 AW893559 AA984413 AA484993 AA491098 AW504790 AA018658 AW902844 T09170
115414	173073_1	AA682240 AW769037 AW769560 AI913396 AA465182 AA214513 AW511261 AA283832 AI767608 AW510759 AW968608 AW967783 AA766028
108218	107976_1	W57550 AA057266 AW797200 AI972066 AA058711 AI874259
115471	11801_1	AK001376 BE386444 BE390867 BE408981 AI126802 AI765051 AI829784 AI810648 AA284708 AW752963 AI380487 AA805701 AA829971 W90692 AI367405 AA693657 AI003180 AA514968 AW972449 AI754241 AA852950 AL121107 AI868791 AI637676 AI760108 AI022771 AI022773 W90758 AI224853 AI246664 AI767311 AI203326 AI378374 AI078556 AA775023 AA856802 AI568198 R85788 AA287138 AW117381 AW242618 BE242067 AI282240 AI077934 AA642983 AI017044 BE263867 BE270147 AA852949 AA223807
114877	58_20	AW024162 AA215804 N99222 AI215760 AA215639 AA410844 AA089529 D62135 AA366317 AW960045 AI168309 AI620911 BE552423 AI632827 N66253 AI762924 AI344470 AI478305 AA235618 AI824177 AI972356
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131101	7970_1	BE387561 W39108 BE256362 BE049300 AW245546 BE543251 AK000543 AW582924 BE245042 AW247754 AW503237 AA037343 AA380550 AA084266 H85635 AA577694 R83455 AA057499 R20350 BE267698 AW997305 AA336686 AA143370 AA053342 BE257631 AL050225 AA303698 H63274 AA393415 H91368 AW402791 AW389378 AW389358 W89161 AA336560 AW960735 F11549 AI871608 R85234 R90913 AW250312 AA057745 AA215726 AA490431 BE612808 AA458740 AW898429 BE618049 BE077016 BE548871 AW404030 N72514 T27273 H48608 H73019 T30417 AW952016 T27342 AA090165 AA384277 AL038685 BE090366 BE090498 BE090506 N53556 W92357 N22745 AA058527 AW245992 AW519163 AA827565 AA778844 AA609876 AW418554 BE549385 AA865787 AA582451 R43735 8E350564 AA857077 AL041251 AA053343 AI459173 AW271278 AI088812 H56312 AI922985 AA421008 AW273565 AW839472 AA054220 AI983745 AW473566 AA632354 W92321 AI252620 AW075525 AA057754 AA916396 BE244907 H48800 AI276992 AA688188 AA465218 AW089078 AA813504 R90914 AI244608 BE243339 H69697 H77911 AA457479 AA770572 AI094194 AA435687 AI287782 AW074674 R85235 AW074496 AW339961 AA779806 AW339652 H63717 H42212 H85008 M79220 AA777251 H91070 AW236192 D56982 AW103971 AI991944 AW583947 AI690863 AW250987 AW050679 AW196196 AI381358 AW895771 AA282896 AA205662 BE544924 R46159 BE258779 AA053876 H42283 N84165 8E294648 AA465573 BE613259
101032	10618_1	8E206854 M55674 M18172 NM_000290 BE263723 R58471 J05073 AA192133 AA077207 W21455 AI016327 N47645 AA192732 AI208606 AA781116 C04893 N86080 AA634505 F28198 T28690 AW950710 N57500 F32816 AI338544 AI340296 F24817 AA192659 AI338303 F29892 C05250 F36165 F33897 F22479 AI159928 F35509 F33462 F36911 F24672 F32750 AI018135 F33256 F18881 F26107 F31842 AI200819 AA085861 AA947198 N93414 BE264368 F31524
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131148	52061_1	AW953575 BE563938 AV651228 AI858629 AW238652 AI811530 AW238464 AA775509 AA639961 AI951020 AA906505 R23723 AA588751 AI278514 AI683943 AI817634 AI023936 AI890265 AI955543 AI985699 AI378931 AI472890 AA076610 AA626034 AI924309 AW302595 AI400768 AI811323 AI291597 AI077673 AI168626 AA843925 AW873776 AW043643 AA186897 AA469417 AA688138 AA844033 R70906 AI167393 AA160381 AI146463 AI828457 AI346389 AW269507 AI890963 AA932817 AW167175 AI092688 AI419413 AI471235 8E544155 H21906 N95055 AW472733 AI858698 AA482254 AW117913 AI682734 AI022434 AI561317 AI075057 AI572472 AA631038 AI283412 AI400366 AI446687 AA253195 AW472934 AA580370 AI587086 AI740811 AW242097 AI383070 R82585 AI830090 AW104925 R63720 AI288461 AA079633 AI475132 AA372564 AI932899 AI474703 AW304099 AA159711 BE348964 AA935864 AA158761 AW510468 H97740 AW268508 AI887113 H99748 AW273008 AW190612 AI369025 N62092 AI860660 AA258377 AA352092 AW591233 AI880674 AI436339 AI913025 AW662621 AA614431 AI679511 AI921444 AA654360 AA159816 AI814625 AI858794 AA506029 AW050524 AI452382 R26913 AA480373 AI493331 AA568164 BE122868 AI816752 R38317 H01942 AW966626 AA086218 AA471074 BE621616 AW675760 AA468424 AW265590 R70940 R32172 BE005080 AA253194 AI004583 W38893 BE185114 BE075317 AI291596 AA258741 AA618219 AA385499 AW238247 8E350407 R23770 R77169 AA468385 AW604657 AA328654 BE000238 AW999382 BE000173 AA482352 R27158 AW798741 H21696 AA296799 R63767 T24990 AA382912 AA328285 BE181673 BE181669 AW384494 N87013 T48546 C00038 AW392769 AA610151 AW604655 AW999091
100409	16383_1	D86957 R18311 AA355702 BE243986 AA378298 AW949846 AW949836 T23850 H08699 R61058 AA029836 H77466 R16502 T84799 AA002107 AA057630 H47819 AA001632 BE149652 R05744 AW607947 R07807 H94800 AA532723 AA233835 H64311 AA441958 R87603 AW883728 AA618204 AA618218 H13046 R66017 R24618 R66031 AW813015 AW170534 AI739572 AI291141 AA086032 BE244483 AW946851 AW368448 AA057669 AA001633 AI813366 AI148468 AW513472 AW162963 AI419243 AA029296 AA702798 AA452039 AW770879 AW341005 AI131361 AA599261 AI458979 AI745081 AI087126 AI634008 AA446924 AA975358 AI299593 BE504239 R66018 AA025899 AW665186 AI039660 AA235356 AI272907 H47820 AI917947 R34247 H08700 AA025747 H64312 AA002108 R66032 AI864466 AW771345 AI333200 AI765707 AI934756 BE245539 AA508656 R60938 T50028 AI335897 AW022337 H75428 H77467 AA614329 AW194912 AW050786 X84713 AI695534 AI659317 AI217093 AI926884 AA625211 H13256 R24515 T91129 D25728 AW138058 R42287 R18800 AW582016 AW161406 R90781 AA326433 AW163611 BE085910 W22101 AA298217 AA443347 AW470117 AA337340 AW044412 AA445950 AA445927 N59157 AW265503 H46577 H18977 AI538390 H47012 AW105475 AW013946 H51387 AA912311
131170	8113_1	NM_014253 AF100772 BE088769 AL022718 BE161779 AW863569 BE161640 AL039060 BE168542 AW296554 AA323193 AA235370 AW779760 N48674 AI375997 R45432 D59344 AI203107 F07491 R35360 R25094 AI913631 AI498402 T61382 AI016320 N45526 T61415 AA331486
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100447	13274_1	NM_014767 D87465 AI138758 AJ001453 BE315492 AL119602 AA323454 AA324193 H14434 AI372719 AA349626 AI372720 BE392102 AW503953 BE466278 AW029058 AI492113 H14384 AA349625 AA324192 AA326695 R52857 AA019306 AA021656 Z42668 AA323883 AA378569 AA350904 AI372419 AW404848 AA324503 Z42460 BE379289 BE394456 H15894 AI372421 AW607813 AA341681 AA323752 R88491 R90802 AA350810 AA325142 AA399317 AI952009 AW444587 AI829285 AI985914 AI627590 AI024341 AA398230 AI886803 T59381 AI014310 AI015469 AA080905 T33681 Z42334 T30945 T30906 T33219 H17555 AA776204 AA323721 BE392352 AA326015 BE294053 AA323277 AA341603 AL041008 R55664 BE395340 AA420642 M78925 AA493844 AA296883 BE394689 AA404699 AA806818 AI372420 AI953017 AI953273 R43882 AI356317 BE378447 AI672782 T30918 R90803 AI919449 BE350066 AA021487 AW071828 AI589288 AA635623 AW269658 R55665 AI423403 AI524197 AI333826 AA815454 AI051257 T03448 AI418846 AA814571 AA084339 AI553739 R58899 AI809288 AI221743 AI740981 AA291537 T33644 AI356753 T33610 AI024694 AA912707 AI372418 T16022 AA894697 AI339970 AI797874 AI350316 AW085823 AA678937 AW576501 AA910596 AA628149 AA953514 AI887011 T33218 AW378345 AA782949 AI475040 AW518669 AA805970 Z38828 T33680 F01860 AA019030 AI888030 BE388681

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130553	30653_1	AF062649 AA405947 AW602820 AA075247 AF095287 AA039876 AW957275 AA033896 AA430241 AA249470 AA314652 AA007646 AA380236 AF075242 AA436999 N23584 AA477063 BE544942 AA055311 H64056 AW750040 AI571797 AF095289 AF095288 AI569781 AW750100 R83062 AA081272 AI052735 AA287672 AA781104 N73057 H90483 N76842 AA286786 AW261964 AI870484 AW515957 AI598181 AI073718 AW874587 AA033949 AA081273 N93408 AA781338 H64006 AA706787 H77519 AA074947 AW575580 AA075073 AA007621 AI970768 AI037954 AA705320 AI187853 AW272792 N53693 AI192508 BE184054 AI140876 AI698655 AA861023 N93319 H52544 AA476952 AA812948 AI445235 AI362866 AA693507 R93114 AA442827 AA287855 AA780128 AI302602 AA405385 AA772482 AA992412 AA041520 N55467 R83011 H77520 AA287854 AA430032 AA555210 H58693 AI185954 H67910 R70335 N51912 AW023686 H94652 AA960936 H66067 H60873 R93232 AA627719 H90427 AA764752 AA806062 AI933075 AA287547 AA055312 AW082280 AA404964 H82417 AI498735 C21248 AI910658 BE328455 T25511 BE261824 AA075235 H66113 H82677 AA352192 H60872 H67960 H58303 H67633 H52308 AW796097 AW796134 AW796237 AI811894 AA644227 AJ223953 AA203476 AA383595 AA405133
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101148	15647_1	NM_002923 L13391 L13463 AL035407 AL036629 BE569163 F11824 AA370404 AA081962 AA045784 AW802455 AW839121 AW839129 AA024480 AW579329 AW579342 AW385922 AW579349 AW579370 AW802573 AW579362 AW579367 AW385932 AA122107 AW838807 W07429 AA447937 AA054576 AI656059 AI761246 AA035363 R23120 W69610 AI914095 W55965 AW794213 AW580877 AW951385 AA054537 T29501 W55966 AI935457 BE463897 AI750159 BE218280 BE326769 T65391 N27484 AW193673 AW364934 AI813697 AI652515 AW071950 AI989883 AI989708 8E466665 BE066793 AA058867 AW138286 AW779721 AA036732 H15243 AI139398 8E066840 8E066709 BE066779 AW302145 BE066737 BE066731 BE066805 BE500956 AI567516 AA835167 AI913304 N75846 AA917654 AI346555 AA024481 AI970916 BE467277 AW467527 AA122108 AI126225 AI802267 AI675283 AI569765 AI921562 AI830405 AI090227 AA741487 AA596048 AW005502 AI493891 AI291733 AW237817 AA035364 AI804769 AA830268 W69486 AA045785 AI347989 AI272915 AI651216 AI304403 AI675670 AI829243 AI185343 AW001615 AW076046 H05767 AI971761 AW594212 AI291581 AI948917 AW139656 AA834091 AA648362 AA948018 AW204522 AA815078 AA506569 AI582934 AA160026 AA593757 AA448872 AA775569 AI868965 AI313511 AI282765 AI209025 R23121 AI140249 AW439959 AI399711 AA082833 T82268 AI457374 AI288423 AA769947 F09473 AA708846 AA922770 AW449904 AW006543 AI141220 AI950611 AA593717 AI828641 AW295146 BE328155 AI969935 AI350545 F02032 C00527 R45897 AA582633 AA975385 H15242 T65468
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130639	86510_1	AI557212 AI245308 AI261985 BE465474 R25408 AW294869 AA862980 AI619809 AW614948 AW768832 AW591097 AW129774 AI784324 AA621589 R85948 AI333148 AW117302 AA404519 AA165508 AI498674 AW662250 AI827162 D59570 AI696923 AW173727 R62539 AA278329 AI689073 AA513300 AW515987 AW779041 AW079702 AI346562 AI358240 AW778903 R80410 AI479216 AI884330 AI273999 AA953430 AA017059 AW118511 D59711 H38124 R73683 AA021464 T93119 H40632 AI493590 T93220 R28435 H11195 AA167402 AI633798 AW182534 R80519 AA743632 R73775 AA743634 AI267413 AA214448 AA279000 AA743859 AW959595 AA300011 R78798 D59748 D80362 R62538 AA165541 D59651 D59712 D59571 H38123 H38360 AW752148 AW352128 AW352124 AW352115 AW352122 AW388317 AW352116 AW388483 AW388478 AW388597 AW375680 BE169597 AA361084 AA017210 AA021463 AW795970 AW838177 AW898617 AA300012 AW963818 AW629985 BE150641 H00388 AA375656 AA831259 R76419 BE150642 N66962
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331341	172787_1	BE541042 AW069774 AW664160 AW189935 R27296 AI872737 H04753 R67040 AA687583 R78627 AA214158 W02221 AA303125 AI865269 R46578 AI571977
331353	191360_2	AA953006 AI276403 AI277578 AA256327 AA406577 AA479917
331363	18581_1	AW582256 AW956284 AF038451 NM_006408 AA316115 AA315629 AW369360 AA314225 AF007791 AA421527 BE072059 AI817063 AW194118 AW192785 AI075324 AA298537 AI634717 AI380637 AW151674 AI888294 AW190856 AW364247 AI080640 AW152548 AW002338 AW614754 AI445913 AI828325 AA573742 AI436796 AA909945 AI735767 AW304001 AI475938 AW303846 AA582017 BE076995 BE049240 AI678847 AW471069 AI720013 AW951790 AI888914 AW272720 AI801054 AA582851 AW073291 AA583091 AA315049 AI828251 AI801784 AI805627 AI025266 AA776960 AI559391 AI800431 AI800451 AA838499 AI378681 AA884931 AI242802 AW769127 AI184843 AA316874

		AA565996 AA442829 AA593818 AW027843 AI249798 AI378390 AI277266 AA552670 AA970336 AI473626 AI275085 AA622524 AI610106 AI291994 AI476691 AA838482 AI925030 AI146786 AI582452 AI537173 AI040152 AI678427 AI469656 AI445130 AI916480 AI285429 AW602019 AI358508 AA687567 AA421562 AA425142 AW190915 AA570785 AI888732 AA632103 AI924494 AW152169 AI891014 AA565444 AW191880 AW591300 AA581848 AI473553 AI675714 AA501945 AI685830 AI469613 AI933636 AI972701 AI972499 AI581525 AA526975 AI623264 AA639696 AA513297 AI400863 AW080588 AA558986 AI926128 AI537212 AI695291 AA327356 AA625485 AF088867 AA298527 T24475 AA476675 AA055880 AA314206 AA315408 AA316508 AA307697 AW844413 AA314052 AW370274 AW582421 AW364225 AI815198 AW166169 BE072073 AI675865 AA315613 AA426228 AA314146 AA437001 AA307795 AA316233 AA314372 AA316967 AA315724 AA313235 AW369331 AA244356 T86663 AW868072
331393	7091_1	AW976438 AF227899 AL079586 AW242991 AA296993 AF083249 AA743290 AA082927 H38607 AA046204 AI458928 AA810515 AI985329 AW450239 AA279595 AI632699 AI091806 BE221365 AI130893 AA082926 AI017851 AI474175 AA669471 AA169631 AA248905 AL133594 H08612 AA247824 AA399016 AI268687 AA479433 BE467082 AA961159 AW890022 AW890015 AW899450 AW890140 AW890016 AI656542 AI656530 AI284462 AW590370 T61838 AA478729 AA047401 N53320 AA834839 AW264473 AW007865 AA249450 AA167427 AI365221 AI701000 AI680921 AA385375 AW954119 AI860823 C75362 AI492007 AI539819 AW014989 AW628976 AI473662 AW276150 AA047467 N67246 H08613 AI559629 AI811077 AI039475 AI431949 AA907555 AI915180 AW148492 AI242862 AI365222 BE018520 AA412178 BE302119 AI823337 AA905198 N83376 AI382420 AA776507 T94766 W67770 AW369401 AA262427 W84569 AW968527 R20183 AA485189 F06553 BE080982 AW995604 BE080849 BE080826 BE080978 AA167428 BE080830 AW995687 AA171673 AW995686
331406	8041_1	BE176893 BE176888 AA397686 AI620405 AI299697 AI702708 AA987446 AI693106 AW889017 AA442537 AI922509 AI653242 AW237517 AW418517 AA806072 AI968500 AI760938 AI537876 AI811401 AW244033 AL046630 AI143522 AW263905 AI985159 AI962850 AI202886 AW300419 AA251838 AA861778 AI025639 AA399033 AI924740 AI800259 AA179395 AA610064 AI865176 AI289921 AA565722 AW770029 AW439544 AI025969 AW380171 AW080913 AW749363 AA496833 R58228 H09840 AA836330 AA764813 AI352142 T31439 Z43462 F08407 H47178 AI114660 N48131 AI061591 N48117 BE167338 AW384456 T19719 R23036 AW384458 N38985 T19720 AA075344 AI671613 AW842474 BE550608 AA778899 AA279243 AA496875 AI888310 AI088077 AI493142 AI338275 AW872997 AI459760 AA909786 AI292044 AA136299 H09755 AA279929 AA279124 AI871819 AI924804 N38971 AI000293 AW022179 AA952968 R22931 AI244527 AI003708 Z39538 F04624 H47088 AF180425 W56074 AA287344 H96262 W19197 AA456123 W38634 AA428762 AA485167 W24739 AW368029 AA236691 BE075101 AA136180 AA075597 AI217101 R81770 AA410581
331432	193887_1	AA262451 AA760878 H67704 AA748621
331442	48779_-2	H77381
331492	11196_1	AK001114 AI949698 AI694727 BE501500 AI436121 AI769868 AI298375 AA026113 AA723068 F13681 AA908961 AW821352 AW976618 AI814359 AW070254 AA933772 AW298059 AI829001 AW515661 AI346450 AW664032 AA909492 AA961461 N34017 AW371083 AA918350 AI346671 AI337550 T86138 AI128634 AI738898 AI738907 AA026199 AA089670
331517	288032_1	AA765603 AI675581 AI355934 AW166822 AI566925 AA767454 AA814384 AA730044 AW070292 N48610 AI341862 AI683402 AA424064 N23063 N23090 N38898 AI627249 AW339549 AI281421 AA708329 AW976803
331661	452840_1	W52448 W52773 AI201922 AA781389 AI651363 BE550487 AW236796 AW304858 AI695978 AI220182
331686	1153509_1	AW474960 W88502 H70430 W86162
331919	300127_1	AA446869 AI368257 BE550153 AI080424 AW590470 AI478438 H46178 AW975073 AI701561 AW204114 BE165640 AA658113 AI214533 AW206932 AW885560 AW607277 AA446983 R49782
332002	188158_1	AI579909 AW967587 AA766314 AW173502 AA831027 AA991192 AW407403 AW299333 AI356937 AA761270 AI979179 AW207045 AA482009 AW070877 AA280294 AW469832 AA250879 AA251072
332043	262097_1	AA371307 AW968802 AA988769 AA642428 AA490831 W96347 AA649036
332120	374423_1	AA609684 AA758732
332256	349165_1	AW975028 AA551969 AA644028 AA689303 AI220334 AI220090 AI925480 N66393
332265	1028361_1	AW770320 AW119114 D61961 N74375 N74427
332314	477192_1	R41396 T25915 H23454 AA846250 H42125 D62549 H18484 C00804 AI446466 AW206738 AI445643 T25862 AI339005
332340	22951_1	AP000692 NM_005128 AJ237839 R82151 AB023150 AW410488 AJ003273 AW379450 AA322182 R82140 AJ001857 BE004377 AW083855 AI096738 AW070676 AA678924 AW085802 W15495 BE551040 AI699147 AI510780 R82143 R82122
332386	399_1	NM_000481 D14686 D13811 AU076448 BE293629 BE305090 BE250035 AA341258 F11299 F07978 AI129601 N85119 W79101 C18828 R09579 AW850108 N78273 AW950618 H79161 BE008484 AI081517 AA534975 AI290815 AA741122 AA921395 AW591508 AI885347 AI348172 N59532 W79815 AA947150 AW074248 AW751377 AI057053 AI346712 AI193862 H85887 AA983969 AA804465 AA886299 AI217497 AI351816 F08959 AA503087 AA993107 F04230 AA550742 AA962122 AA969722 AI625176 T28574 AI767567
332397	35955_1	AB027249 AF237709 BE245643 AW403476 AB027250 AF189722 AA353579 BE537775 W25389 AW962279 AW818197 AA449542 AA448898 AW974523 AW195611 AI393315 AI738792 AW665895 AW574679 AA913471 AA651780 AA737663 AI015407 AI366737 AI285359 BE245537 AA740847 AW513628 AI278471 AA405512 AI955022 AI276896 AI932328 AA971676 AI002631 AW193686 AW118095 AI969593 BE466775 AI375878 AI911763 AW269502 AA476576 AA768652 AI300231 AI216689 AI287319
332430	53900_1	H25350 H28544 AI955873 N29952 N29938 R12730 AA229527 H25302 AA854239 AW051288 AA598738 H62306 AI337901 AI056386 T18606 H82372 AI761586 AI889010 AW043582 AI765252 AA620587 AI190510 AI494128 AI161119 AI457908 AI420691 AW236132 AI917195 AI949791 AI433283 AI146385 AI074325 H62210 AA846154 AI344715 AI982957 AA524256 R39782 AI360821 AI124983 AA723581 AI289068 AW137304 AW073116 W37495 AI335838 AL121074 AW264699 AA865259 AI089458 AA782578 AA788618 AA595002 AI167549 W07131 AL120665
332530	2356_1	M31669 M31682 M13437 AW370612 F00759 AI659282 W44452 AA600841 W44338 AA608807 AW973553 AW973542 AA505620 AI458719 AA936480 AA973451 T29876 AA577032 AI874161 AA670038 AA469911 AW006085 AI693790 AA872040 BE467580 BE467714 BE467700 AW971179 AA431428 AA938692 AA416873 AA493619 AI671596 AW590794 AW016444 AI971108 BE077433 C02533 AA593753
332567	8509_1	AW939251 NM_005252 AU076596 V01512 V01512 AW579056 AA249247 AI590359 AW510478 AW518282 BE046054 AW874080 AI268596 AA996237 AI695592 AI244117 AA290764 AA401957 AA505878 AA428304 W74018 W74016 AA040944 AI272071 AA745909 AA620979 AA019816 AI245094 AW009706 AA662536 AW024264 AI268601 AA932024 AW513222 AW024169 AI659705 AA932526 AA975329 AI567603 AI889320 AA514238 AA020837 AI623966 AA843677 AA477453 AA496353 AW372625 AV656426 K00650 W96348 N62388 R95977 AA434270 AI093633 T27639 AW960245 AW881177 R15253 N36936 F07701 AA319315 AA337290 AA284642 AA344052 F05184 AA351062 AA378451 AW794233 AW884380 N36951 R49879 AB022276 AA300350 AW839435 AW191708 BE220350 AA280404 AA485546 AW794235 AV654223 AW838891 AA295986 N72823 AA335648 AA371089 AW845414 H63166 R12840 AA379680 AA477579 R13148 H71003 H71015 AA362156 AW750674 AW845415 AA366924 AW608044 AI570388 R31511 R33906 R33921 AW663022 AW360985 AI207838 AW607239 AI672451 AI573282 AW794752 AA370328 AW998896 AW797239 AW998912 AW794742 AI954543 AI810067 AW073373 AA370325 AW195330 C18106 AW998736 R79476 AA429721 AI891081 AI381534 AW022137 AW020000 AI630329 N99428 AI870222 AI971257 AI922196 AI857753 AW579397 D56749 AI925005 AI685727 AW805573 AI982678 AI784604 AI005625 AW877772 AI634947 AI950829 AA493243 BE166086 AI801820 AI925643 AI627992 AW316704 AI261318 D57757 AA887178 AW770406 AI972075 AI222254 AI675794 D58060 AI701954 D58166 AI799500 AW805669 AW276098 AW874253 AI962991 AI248184 AW996924 AI017462 AW022260 AI885957 BE176841 AA878863 AI697419 AW662094 AI479529 BE177025 D57403 AA507952 AW664593 AW800998 AI985773 AA566089 AA442759 AI624670 AI460284 AI800205 AI537788 AI537593 AI244382 AA583463 AA922678 AA864382 AI610837 D58070 AA844283 AA947992 N73801 AI453821 D58184 AI678887 AW243755 AA746085 D57742 AA757380 R44148 AA496403 BE180303 AW363528 BE006616 D57395 AW805507 AW805511 AA617991 AI373585 H30122 D57744 AW805501 D57691 D58148 AW873164 AW768483 D57601 AA777812 AA837997 BE180123 D57599 AA485387 AW022208 D58096 N67917 W95944 AW805506 D57518 D57990 AI074096 D56521 D58151 AA428720 D56648 D57778 AW805504 D57750 D58108 AW021706 D57449 D57041 D58277 D56935 AI356974 D57023 AA018712 H27631 D57851 D57514 D57268 D57468 AW805646 AI278945 D57323 D56986 D57539 D57829 D58078 AW805515 AI348684 D57772 R74449 BE041558 D56746 AW798485 D56640 AA985597 D56702 D56849 D56874 AW581419 AA470397 D57591 AW798984 T27640 N66497 D56803 AA618186 AW805647 D57945 N23726 D56637 N23730 D56992 BE176882 BE176839 BE176909 D56757 N68137 D56987 AI559806 AA631437 D57464 D56718 C17030 T29278 D57377

		AW021936 AW118330 AA515358 D56610 AA494092 D56934 T97774 AI473546 R74350 R84834 AA579200 D56616 C03207 D57391 N52416 D56928 R79209 D56925 AA020879 D45546 AI858769 R20750 T09381 F01435 AW627906 D58202 AI933993 F01912 H27552 AA174191 T16515 AW023216 AA434146 H83387 AI346751 V01512 V01512 AA576407 AW365140 AA937471 BE174681 AI568829 AI274663 R85530 AL048225 H83388 AW798734
332577	89088_2	AI826268 AW248872 H69511 AI748806 AW779557 AI992254 AI890377 AW151271 AI356374 AI634503 AA777065 AI590131 H37767 AI889058 H69512 AA046480 N27343 AI573008 AW130925 AI635838 AW594603 AW000790 AI208239 AI275835 AW090294 AA021587 AW273456 AA505726 AW469424 AI400222 AI025723 BE046148 AI128668 BE350462 AW302601 AI299977 AA284809 AI640358 AW470364 AI241794 AA650048 AW090027 H15377 AW615318 D60021 AI934336 AW118536 AI041281 AA614238 R85918 AW571741 AW516692 AW572232 AW515188 AI798585 AI392825 Z40518 AI869580 AA469975 AI537819 AI810684 AI701744 AI370410 BE383083 Z44676 BE002481 BE002532 AA456765 N44196 D60022 C14604 AA021099 AA284872 BE266647 AW249292
332640	4172_1	BE568452 BE297396 AA449593 AW732490 AW069736 BE548667 AA207229 AF044588 NM_003981 BE268994 AW444578 AA471151 BE250747 AW732555 AA074582 BE336856 AW408764 AA191159 BE092129 AA310614 AW958677 AA312276 AW750027 AW750046 AW750032 AW750024 AA188893 AW750054 AW408409 AW750030 BE151875 AA478509 N58721 AA195614 H70079 H75580 BE250401 AA454518 AA007263 AA626405 AA417152 AA004230 AA557354 AW863151 AW863181 AA702179 AI924143 AI671185 BE006198 AA190630 AI638795 AI609113 AI056239 BE537023 BE464668 AA634413 BE208066 BE208833 AW250803 AI337375 AA478510 BE501624 AI814763 AW594726 AI091408 AA827285 AA189108 AW594169 BE618589 BE618040 AL135398 AA632206 AI080126 AI638180 AA725439 AI379107 AI288872 H14801 AI679151 AI263619 AI559213 AI679722 W93249 AA552345 AA417030 AI969543 AA534494 AI038181 AA766364 AA573241 AI754325 AW043937 BE207865 AI291838 N73585 N73539 AW805051 AA808510 AI699813 AW166044 AW104716 H05808 AA248270 BE538022 N56013 AA621586 AA149737 D19671 AW192890 N54283 H73339 AA910989 BE273424 BE560082 AW959012 AA313552 AW750034 BE072537 BE297947 AW732361 AA449336 D29574
332732	5436_1	AF191019 NM_015516 BE546494 AL110276 R13844 BE313586 BE336912 R18704 R18703 AA045868 T70952 BE336901 T60387 BE149749 BE271848 BE271902 AA489929 Z45402 T64360 AA305745 AA009451 T95706 H14907 AA299901 C03221 T72431 AW471185 AA335297 AI269100 AA345072 AW965160 H27581 R48910 H25380 AA335281 AW973283 T79590 AW183447 T64172 AI744097 AI342358 AA336102 AA335299 BE208375 AI140834 AA088181 AI860314 AI738613 T70902 R42077 AI884558 AA489798 AI130828 AA009735 H25381 AW612425 R48801 H27507 H30105 H44671 AI631362 AA558470 AW014412 AA552059 AA045801 AW589435 AI039657 H14614 AA974256 R42078 AI245758 T61886 AI559202 AI074139 AI817313 AI041484 AA437138 AI613032 AI147891 AI457945 AW197727 AI074399 AI758636 AI598048 AA972077 M85390 R36989 R71936 AI867492 T40081 Z41115 AA772775 T41013 AI695691 T40996 AI826822 N93464 AW955524 AA088651

TABLE 1C

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al. (1999) Nature 402:489-495.
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
332792	Dunham, I. et.al.	Plus	73381-73768
333135	Dunham, I. et.al.	Plus	3361208-3361369
333137	Dunham, I. et.al.	Plus	3367643-3367726
333138	Dunham, I. et.al.	Plus	3369205-3369323
333139	Dunham, I. et.al.	Plus	3369495-3369571
333516	Dunham, I. et.al.	Plus	5570204-5570390
333517	Dunham, I. et.al.	Plus	5570729-5570925
333795	Dunham, I. et.al.	Plus	7807688-7807795
333796	Dunham, I. et.al.	Plus	7808253-7808319
333808	Dunham, I. et.al.	Plus	7880600-7880775
333809	Dunham, I. et.al.	Plus	7880600-7880775
333845	Dunham, I. et.al.	Plus	8005832-8005945
333849	Dunham, I. et.al.	Plus	8018323-8018472
334101	Dunham, I. et.el.	Plus	9973413-9973550
334616	Dunham, I. et.al.	Plus	15176123-15176470
334891	Dunham, I. et.al.	Plus	19299770-19299944
334899	Dunham, I. et.al.	Plus	19315168-19315311
334900	Dunham, I. et.al.	Plus	19315678-19315743
334902	Dunham, I. et.al.	Plus	19317083-19317195
334905	Dunham, I. et.al.	Plus	19322553-19322680
334906	Dunham, I. et.al.	Plus	19323493-19323590
335044	Dunham, I. et.al.	Plus	20842088-20842682
335149	Dunham, I. et.al.	Plus	21497441-21497587
335809	Dunham, I. et.al.	Plus	26310772-26310909
335810	Dunham, I. et.al.	Plus	26314767-26314849
335824	Dunham, I. et.al.	Plus	26376860-26376942
336054	Dunham, I. et.al.	Plus	29161685-29161937
336721	Dunham, I. et.al.	Plus	3371522-3371586
337182	Dunham, I. et.al.	Plus	23934889-23934962
337674	Dunham, I. et.al.	Plus	3332616-3332697
337675	Dunham, I. et.al.	Plus	3335368-3335505
337755	Dunham, I. et.al.	Plus	3971764-3971900
338038	Dunham, I. et.al.	Plus	8138219-8138392
338316	Dunham, I. et.al.	Plus	17089711-17089988
333124	Dunham, I. et.al.	Minus	3318017-3317932
333743	Dunham, I. et.al.	Minus	7573218-7573060
334221	Dunham, I. et.al.	Minus	12730944-12730387
334222	Dunham, I. et.al.	Minus	12732417-12732289
334282	Dunham, I. et.al.	Minus	13285293-13285178
334502	Dunham, I. et.al.	Minus	14488605-14488526
334578	Dunham, I. et.al.	Minus	15004462-15004304
334951	Dunham, I. et.al.	Minus	20147708-20147502
335289	Dunham, I. et.al.	Minus	22305950-22305708
335290	Dunham, I. et.al.	Minus	22309950-22309891
335293	Dunham, I. et.al.	Minus	22316408-22316275
335682	Dunham, I. et.al.	Minus	25421215-25421093
335753	Dunhem, I. et.al.	Minus	25761535-25761444
335755	Dunham, I. et.al.	Minus	25763806-25763747
335756	Dunham, I. et.al.	Minus	25764330-25764251
336662	Dunham, I. et.el.	Minus	2158060-2157993
336684	Dunham, I. et.al.	Minus	2158060-2157993
337603	Dunham, I. et.al.	Minus	1299296-1299194
338561	Dunham, I. et.al.	Minus	22311966-22311856
338562	Dunham, I. et.al.	Minus	22312594-22312465
339186	Dunham, I. et.al.	Minus	32339211-32339097
325889	5867087	Plus	223829-223891
330032	6682596	Plus	85177-85237
330033	6682596	Plus	86663-86723
326213	5867224	Minus	60751-60927
326816	6552458	Plus	198354-198436
327110	6117842	Plus	94608-94785
327821	5867968	Plus	131060-131232
328164	5868068	Minus	27080-27226
328648	6004473	Plus	424829-424959
329365	5868838	Minus	107687-107765

Table 2A lists about 1165 genes selected to have an interesting expression pattern during androgen withdrawal of prostate cancer tissue. These genes were selected by analysis of variance, such that the P value is less than 0.01, the 90th percentile exhibits a minimum of 100 average intensity across all samples, and a comparison of any group means shows a minimum 3 fold change. The interesting expression patterns can be broadly defined into the following categories:

1. Genes that are expressed early in the time course of androgen withdrawal, then drop off in expression, and then express again with emergence of androgen-independence (hi-lo-lo-hi pattern in table 2A).
2. Genes that are expressed early in the time course, then drop off in expression immediately after androgen-withdrawal, and do not express again with emergence of androgen-independence (hi-lo-lo-lo pattern in table 2A).
3. Genes that are expressed early in the time course, then drop off in expression after several days of androgen withdrawal, and do not express again with emergence of androgen-independence (hi-hi-lo-lo pattern in table 2A).
4. Genes that are not expressed early in the time course, but express only with emergence of androgen-independence (lo-lo-lo-hi pattern in table 2A).
5. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and continue to express with emergence of androgen-independence (lo-lo-hi-hi pattern in table 2A).
6. Genes that are not expressed early in the time course, but then express as androgen is withdrawn and drop off again with emergence of androgen-independence (lo-lo-hi-lo pattern in table 2A).

Table 2B lists accession numbers for primekeys lacking a unigeneID in table 2A. For each probeset is listed a gene cluster number from which oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Table 2C lists genomic positioning for primekeys lacking unigene ID's and accession numbers in table 2A. For each predicted exon is listed genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

TABLE 2A: ABOUT 1165 GENES SELECTED TO HAVE AN INTERESTING EXPRESSION PATTERN DURING ANDROGEN WITHDRAWAL OF PROSTATE CANCER TISSUE

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
Pattern: Broadly defined expression patterns during androgen withdrawal

Pkey	ExAccn	UnigeneID	Unigene Title	Pattern
433412	AV653729	Hs.8185	CGI-44 protein; sulfide dehydrogenase li	lo-lo-hi-lo
429097	AK001270	Hs.196086	hypothetical protein FLJ10408	lo-lo-hi-lo
442731	AI868167	Hs.131044	ESTs	lo-lo-hi-lo
420820	W26096	Hs.336635	Homo sapiens, clone IMAGE:4179482, mRNA	lo-lo-hi-lo
422267	AB033044	Hs.114012	KIAA1218 protein	lo-lo-hi-lo
416953	N31537	Hs.269046	ESTs	lo-lo-hi-lo
413277	H24177	Hs.75262	cathepsin O	lo-lo-hi-lo
410209	AI583661	Hs.60548	hypothetical protein PRO1635	lo-lo-hi-lo
428523	AW974540	Hs.98626	ESTs	lo-lo-hi-lo
435847	W93821	Hs.39780	CDA017 protein	lo-lo-hi-lo
443967	AW294013	Hs.200942	ESTs	lo-lo-hi-lo
440838	AA907075	Hs.131307	ESTs	lo-lo-hi-lo
404054			Target Exon	lo-lo-hi-lo
431697	H66740	Hs.38540	ESTs, Weakly similar to ALU4_HUMAN ALU S	lo-lo-hi-lo
432114	AL036021	Hs.8934	ESTs	lo-lo-hi-lo
446397	AW275603	Hs.200712	ESTs	lo-lo-hi-lo
414094	H15088	Hs.31433	ESTs	lo-lo-hi-lo
424005	AB033041	Hs.137507	vang (van gogh, Drosophila)-like 2	lo-lo-hi-lo
424401	H67220	Hs.169681	death effector domain-containing	lo-lo-hi-lo
449749	AI668611	Hs.49760	ESTs	lo-lo-hi-lo
458368	BE504731	Hs.138827	ESTs	lo-lo-hi-lo
427221	L15409	Hs.174007	von Hippel-Lindau syndrome	lo-lo-hi-lo
432715	AA247152	Hs.200483	ESTs, Weakly similar to KIAA1074 protein	lo-lo-hi-lo
425980	AA366951		gb:EST77963 Pancreas tumor III Homo sapi	lo-lo-hi-lo
412492	AW962604		gb:EST374677 MAGE resequences, MAGG Homo	lo-lo-hi-lo
438882	AA827695		gb:od56c02.s1 NCI_CGAP_GCB1 Homo sapiens	lo-lo-hi-lo
422473	U94780	Hs.117242	meningioma expressed antigen 6 (coiled-c	lo-lo-hi-lo
404211			NM_005936:Homo sapiens myeloid/lymphoid	lo-lo-hi-lo
423019	AI640185	Hs.283626	ESTs	lo-lo-hi-lo
443559	AI076765	Hs.269899	ESTs, Moderately similar to ALU8_HUMAN A	lo-lo-hi-lo
444291	AI598022	Hs.193989	TAR DNA binding protein	lo-lo-hi-lo
428065	AI634046	Hs.157313	ESTs	lo-lo-hi-lo
442566	R37337	Hs.12111	ESTs	lo-lo-hi-lo
442202	BE272862	Hs.106534	hypothetical protein FLJ22625	lo-lo-hi-lo
439456	AI752409	Hs.109314	hypothetical protein FLJ20980	lo-lo-hi-lo
423476	AL035633		Human DNA sequence from clone RP5-1046G1	lo-lo-hi-lo
437952	D63209	Hs.5944	solute carrier family 11 (proton-coupled	lo-lo-hi-lo
451987	AA815092	Hs.77554	Homo sapiens cDNA FLJ14967 fis, clone TH	lo-lo-hi-lo
453408	AI804732	Hs.295963	ESTs	lo-lo-hi-lo
444004	N39842	Hs.301444	KIAA1673	lo-lo-hi-lo
452691	AA164842	Hs.192619	KIAA1600 protein	lo-lo-hi-lo
434865	AW050449	Hs.116507	ESTs	lo-lo-hi-lo
440819	AI809444	Hs.202108	ESTs	lo-lo-hi-lo
419526	AI821895	Hs.193481	ESTs	lo-lo-hi-lo
422072	AB018255	Hs.111138	KIAA0712 gene product	lo-lo-hi-lo
453459	BE047032	Hs.257789	ESTs	lo-lo-hi-lo
419038	AW134924	Hs.190325	ESTs	lo-lo-hi-lo
413243	AA769266	Hs.193657	ESTs	lo-lo-hi-lo
432079	AW972746		gb:EST384840 MAGE resequences, MAGL Homo	lo-lo-hi-lo

441328	AI982794	Hs.159473	ESTs	lo-lo-hi-lo
416508	R39769		ESTs, Moderately similar to ALU8_HUMAN A	lo-lo-hi-lo
451066	AI758660	Hs.206132	ESTs	lo-lo-hi-lo
446017	N98238	Hs.55185	ESTs	lo-lo-hi-lo
447104	R19085	Hs.210706	Homo sapiens cDNA FLJ13182 fis, clone NT	lo-lo-hi-lo
447211	AL161961	Hs.17767	KIAA1554 protein	lo-lo-hi-lo
447765	AW014112	Hs.161390	ESTs	lo-lo-hi-lo
429540	M85776		gb:EST02297 Fetal brain, Stratagene (cat	lo-lo-hi-lo
444314	AI140497		gb:ow76b09.s1 Soares_fetal_liver_spleen_	lo-lo-hi-lo
414555	N98569	Hs.76422	phospholipase A2, group IIA (platelets,	lo-lo-hi-lo
432677	NM_004482	Hs.278611	UDP-N-acetyl-alpha-D-galactosamine:polyp	lo-lo-hi-lo
422091	AI906339	Hs.97927	ESTs	lo-lo-hi-lo
423028	H90946		gb:yu86c02.r1 Soares fetal liver spleen	lo-lo-hi-lo
444040	AF204231	Hs.182982	golgin-67	lo-lo-hi-lo
441111	AI806867	Hs.126594	ESTs	lo-lo-hi-lo
418838	AW385224	Hs.35198	ectonucleotide pyrophosphatase/phosphodi	lo-lo-hi-lo
415999	AA172179	Hs.294029	ESTs	lo-lo-hi-lo
429615	AF258627	Hs.211562	ATP-binding cassette, sub-family A (ABC1	lo-lo-hi-lo
427774	AA278583	Hs.180737	Homo sapiens clone 23664 and 23905 mRNA	lo-lo-hi-lo
438585	AA811371	Hs.123362	ESTs	lo-lo-hi-lo
424776	AI867931	Hs.164595	ESTs	lo-lo-hi-lo
413786	AW613780	Hs.13500	ESTs	lo-lo-hi-lo
421077	AK000061	Hs.101590	hypothetical protein	lo-lo-hi-lo
445837	AI261700	Hs.145544	ESTs	lo-lo-hi-lo
449282	AL048056	Hs.23437	Homo sapiens cDNA FLJ13555 fis, clone PL	lo-lo-hi-lo
414065	AW515373	Hs.271249	Homo sapiens cDNA FLJ13580 fis, clone PL	lo-lo-hi-lo
432527	AW975028	Hs.102754	ESTs	lo-lo-hi-lo
412093	BE242691	Hs.14947	ESTs	lo-lo-hi-lo
457121	AI743770	Hs.180513	ESTs, Weakly similar to KIAA0822 protein	lo-lo-hi-lo
417280	AW173116	Hs.250103	ESTs	lo-lo-hi-lo
452445	AB002438	Hs.29596	Homo sapiens mRNA from chromosome 5q21-2	lo-lo-hi-lo
438624	AA889055	Hs.123468	ESTs	lo-lo-hi-lo
442343	AA992480	Hs.129874	ESTs	lo-lo-hi-lo
401416			C14000338*:gi|7459502|pir||S74665 outer	lo-lo-hi-lo
437176	AW176909	Hs.42346	calcineurin-binding protein calsarcin-1	lo-lo-hi-lo
451663	AI872360	Hs.209293	ESTs	lo-lo-hi-lo
449295	AW137268	Hs.270954	ESTs	lo-lo-hi-lo
426848	H72531	Hs.36190	ESTs	lo-lo-hi-lo
445467	AI239832	Hs.15617	ESTs, Weakly similar to ALU4_HUMAN ALU S	lo-lo-hi-lo
418662	AI801098	Hs.151500	ESTs	lo-lo-hi-lo
416239	AL038450	Hs.48948	ESTs	lo-lo-hi-lo
428054	AI948688	Hs.266619	ESTs	lo-lo-hi-lo
435284	AA879470	Hs.96849	Homo sapiens cDNA FLJ11492 fis, clone HE	lo-lo-hi-lo
424332	AA338919	Hs.101615	ESTs	lo-lo-hi-lo
442369	AI565071	Hs.159983	ESTs	lo-lo-hi-lo
420717	AA284447	Hs.271887	ESTs	lo-lo-hi-lo
439584	AA838114	Hs.221612	ESTs	lo-lo-hi-lo
440260	AI972867	Hs.7130	copine IV	lo-lo-hi-lo
426269	H15302	Hs.168950	Homo sapiens mRNA; cDNA DKFZp566A1046 (f	lo-lo-hi-lo
428398	AI249368	Hs.98558	ESTs	lo-lo-hi-lo
407276	AI951118	Hs.326736	Homo sapiens breast cancer antigen NY-BR	lo-lo-hi-lo
409339	AB020686	Hs.54037	ectonucleotide pyrophosphatase/phosphodi	lo-lo-hi-lo
442150	AI368158	Hs.70983	PTPL1-associated RhoGAP 1	lo-lo-hi-lo
415787	H01463	Hs.93534	ESTs	lo-lo-hi-lo
430685	AI690234	Hs.191666	ESTs, Weakly similar to GNMSLL retroviru	lo-lo-hi-lo
443794	N94104	Hs.29280	ESTs	lo-lo-hi-lo
446215	AW821329	Hs.14368	SH3 domain binding glutamic acid-rich pr	lo-lo-hi-lo
441285	NM_002374	Hs.167	microtubule-associated protein 2	lo-lo-hi-lo
448738	BE614081		gb:601503815F1 NIH_MGC_71 Homo sapiens c	lo-lo-hi-lo
403746			ENSP00000226812*:KIAA1494 protein (Fragm	lo-lo-hi-lo
434022	R18374	Hs.117956	ESTs	lo-lo-hi-lo
435714	AA699325	Hs.269880	ESTs	lo-lo-hi-lo
439848	AW979249		gb:EST391359 MAGE resequences, MAGP Homo	lo-lo-hi-lo
421974	AA301270		gb:EST14192 Testis tumor Homo sapiens cD	lo-lo-hi-lo
433332	AI367347	Hs.44898	Homo sapiens clone TCCCTA00151 mRNA sequ	lo-lo-hi-lo
449919	AI674685	Hs.200141	ESTs	lo-lo-hi-lo
407192	AA609200		gb:af12e02.s1 Soares_testis_NHT Homo sap	lo-lo-hi-lo
436169	AA888311	Hs.17602	Homo sapiens cDNA FLJ12381 fis, clone MA	lo-lo-hi-lo
418624	AI734080	Hs.104211	ESTs	lo-lo-hi-lo
432432	AA541323	Hs.115831	ESTs	lo-lo-hi-lo
426172	AA371307	Hs.125056	ESTs	lo-lo-hi-lo
401093			C12000586*:gi|6330167|dbj|BAA86477.1| (A	lo-lo-hi-lo
426716	NM_006379	Hs.171921	sema domain, immunoglobulin domain (Ig),	lo-lo-hi-lo
439569	AW602166	Hs.222399	CEGP1 protein	lo-lo-hi-lo
451720	AW970985	Hs.290853	ESTs	lo-lo-hi-lo
429163	AA884766		gb:am20a10.s1 Soares_NFL_T_GBC_S1 Homo s	lo-lo-hi-lo
432435	BE218886	Hs.282070	ESTs	lo-lo-hi-lo
408170	AW204516	Hs.31835	ESTs	lo-lo-hi-lo
433530	BE349534	Hs.281789	ESTs	lo-lo-hi-lo
425776	U25128	Hs.159499	parathyroid hormone receptor 2	lo-lo-hi-lo
430068	AA464964		gb:zx80f10.s1 Soares ovary tumor NbHOT H	lo-lo-hi-lo
422725	AA315703	Hs.199993	ESTs, Weakly similar to ALUB_HUMAN !!!!	lo-lo-hi-lo

432314	AA533447	Hs.312989	ESTs	lo-lo-hi-lo
434609	R76593		gb:yi60c11.r1 Soares placenta Nb2HP Homo	lo-lo-hi-lo
448760	AA313825	Hs.21941	AD036 protein	lo-lo-hi-lo
417381	AF164142	Hs.82042	solute carrier family 23 (nucleobase tra	lo-lo-hi-lo
456334	T50392	Hs.271745	ESTs	lo-lo-hi-lo
435445	AA737345	Hs.294041	ESTs	lo-lo-hi-lo
411928	AA888624	Hs.197289	rab3 GTPase-activating protein, non-cata	lo-lo-hi-lo
438869	AF075009		gb:Homo sapiens full length insert cDNA	lo-lo-hi-lo
423932	T95633	Hs.189703	ESTs	lo-lo-hi-lo
422222	AI699372	Hs.193247	hypothetical protein DKFZp434A171	lo-lo-hi-lo
434941	AW073202	Hs.334825	Homo sapiens cDNA FLJ14752 fis, clone NT	lo-lo-hi-lo
415736	AA827082	Hs.291872	ESTs	lo-lo-hi-lo
432722	AA830532	Hs.326150	ESTs	lo-lo-hi-lo
435511	AA683336	Hs.189046	ESTs	lo-lo-hi-lo
432242	AW022715	Hs.162160	ESTs, Weakly similar to ALU4_HUMAN ALU S	lo-lo-hi-lo
451141	AW772713	Hs.247186	ESTs	lo-lo-hi-lo
450546	AA010200	Hs.175551	ESTs	lo-lo-hi-lo
413351	BE086815		ESTs	lo-lo-hi-lo
439324	AF086134	Hs.94309	ESTs	lo-lo-hi-lo
452688	AA721140	Hs.49930	ESTs, Weakly similar to putative p150 [H	lo-lo-hi-lo
415669	NM_005025	Hs.78589	serine (or cysteine) proteinase inhibito	lo-lo-hi-lo
450164	AI239923	Hs.63931	ESTs	lo-lo-hi-lo
417169	R13550	Hs.246773	ESTs	lo-lo-hi-lo
443645	R36475	Hs.24321	Homo sapiens cDNA FLJ12028 fis, clone HE	lo-lo-hi-lo
424878	H57111	Hs.221132	ESTs	lo-lo-hi-lo
449618	AI076459	Hs.15978	KIAA1272 protein	lo-lo-hi-lo
432572	AI660840	Hs.191202	ESTs, Weakly similar to ALUE_HUMAN IIII	lo-lo-hi-lo
400293	N51002	Hs.306480	Homo sapiens mRNA; cDNA DKFZp761E2112 (f	lo-lo-hi-lo
431474	AL133990	Hs.190642	CEGP1 protein	lo-lo-hi-lo
421674	T10707	Hs.296355	hypothetical protein FLJ23138	lo-lo-hi-lo
438494	AA908678	Hs.130183	ESTs	lo-lo-hi-lo
425332	AA633306	Hs.127279	ESTs	lo-lo-hi-lo
451411	AA017492	Hs.135655	EST	lo-lo-hi-lo
419972	AL041465	Hs.182982	golgin-67	lo-lo-hi-lo
434804	AA649530	Hs.348148	gb:ns44f05.s1 NCI_CGAP_Alv1 Homo sapiens	lo-lo-hi-lo
442832	AW206560	Hs.253569	ESTs	lo-lo-hi-lo
408660	AA525775		ESTs, Moderately similar to PC4259 ferri	lo-lo-hi-lo
432674	AA641092	Hs.257339	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
448150	AI472167		ESTs	lo-lo-hi-lo
450468	AW379075	Hs.141742	Homo sapiens cDNA FLJ12211 fis, clone MA	lo-lo-hi-lo
452874	AK001061	Hs.30925	hypothetical protein FLJ10199	lo-lo-hi-lo
412088	AI689496	Hs.108932	ESTs	lo-lo-hi-lo
443451	AI057404	Hs.58698	ESTs	lo-lo-hi-lo
453853	AL040600	Hs.188083	ESTs	lo-lo-hi-lo
419863	AW952691	Hs.93485	Homo sapiens mRNA; cDNA DKFZp761D191 (fr	lo-lo-hi-lo
420729	AW964897	Hs.290825	ESTs	lo-lo-hi-lo
440801	AA906366	Hs.190535	ESTs	lo-lo-hi-lo
407284	AI539227	Hs.214039	hypothetical protein FLJ23556	lo-lo-hi-lo
428279	AA425310	Hs.155766	ESTs, Weakly similar to A47582 B-cell gr	lo-lo-hi-lo
436862	AI821940		ESTs, Moderately similar to ALU8_HUMAN A	lo-lo-hi-lo
432340	AA534222		gb:nj21d02.s1 NCI_CGAP_AA1 Homo sapiens	lo-lo-hi-lo
442048	AA974603		gb:op34f05.s1 Soares_NFL_T_GBC_S1 Homo s	lo-lo-hi-lo
418781	T41160	Hs.8404	ESTs	lo-lo-hi-lo
450642	R39773	Hs.7130	copine IV	lo-lo-hi-lo
451661	AB020650	Hs.26777	Homo sapiens, Similar to KIAA0843 protei	lo-lo-hi-lo
435812	AA700439	Hs.188490	ESTs	lo-lo-hi-lo
448065	AI459177	Hs.172759	ESTs, Moderately similar to ALU7_HUMAN A	lo-lo-hi-lo
453486	AL039201	Hs.173554	ubiquinol-cytochrome c reductase core pr	lo-lo-hi-lo
414312	AA155694	Hs.191060	ESTs	lo-lo-hi-lo
438980	AW502384		gb:UI-HF-BR0p-aka-f-12-0-UI.r1 NIH_MGC_5	lo-lo-hi-lo
408001	AA046458	Hs.95296	ESTs	lo-lo-hi-lo
421476	AW953805	Hs.21887	ESTs	lo-lo-hi-lo
414426	D60745	Hs.25925	Homo sapiens, clone MGC:15393, mRNA, com	lo-lo-hi-lo
444563	N57057	Hs.284163	ANKHZN protein	lo-lo-hi-lo
418771	AA807881	Hs.25329	ESTs	lo-lo-hi-lo
417843	W07361	Hs.22545	Homo sapiens cDNA FLJ12935 fis, clone NT	lo-lo-hi-lo
415565	AA642449	Hs.48994	ESTs, Weakly similar to AF151800 1 CGI-4	lo-lo-hi-lo
419229	AI827237	Hs.282884	ESTs	lo-lo-hi-lo
419905	AW248229	Hs.93659	protein disulfide isomerase related prot	lo-lo-hi-lo
452870	AW502761	Hs.30909	KIAA0430 gene product	lo-lo-hi-lo
449059	AK000566	Hs.98135	hypothetical protein FLJ20559	lo-lo-hi-lo
416157	NM_003243	Hs.342874	transforming growth factor, beta recepto	lo-lo-hi-lo
439305	AW393883	Hs.98968	hypothetical protein FLJ23058	lo-lo-hi-lo
419235	AW470411	Hs.288433	neurotrimin	lo-lo-hi-lo
416640	BE262478	Hs.79404	neuron-specific protein	lo-lo-hi-lo
434938	AW500718	Hs.8115	Homo sapiens, clone MGC:16169, mRNA, com	lo-lo-hi-lo
408177	AI241733	Hs.43871	ESTs	lo-lo-hi-lo
438459	T49300	Hs.35304	Homo sapiens cDNA FLJ13655 fis, clone PL	lo-lo-hi-lo
418381	AA682393	Hs.119237	ESTs	lo-lo-hi-lo
432161	AK000400	Hs.341181	ESTs, Weakly similar to envelope [H.sapi	lo-lo-hi-lo
418283	S79895	Hs.83942	cathepsin K (pycnodysostosis)	lo-lo-hi-lo
421443	BE550141	Hs.156148	hypothetical protein FLJ13231	lo-lo-hi-lo

416619	AF013168	Hs.79393	tuberous sclerosis 1	lo-lo-hi-lo
449802	AW901804	Hs.23984	hypothetical protein FLJ20147	lo-lo-hi-lo
446714	W73818	Hs.110028	ESTs	lo-lo-hi-lo
413195	AA127382	Hs.22404	protease, serine, 12 (neurotrypsin, moto	lo-lo-hi-lo
438233	W52448	Hs.56147	ESTs	lo-lo-hi-lo
416051	AA835868	Hs.25253	mannosidase, alpha, class 1A, member 1	lo-lo-hi-lo
438855	AW946276	Hs.6441	Homo sapiens mRNA; cDNA DKFZp586J021 (fr	lo-lo-hi-lo
425907	AA365752	Hs.155965	ESTs	lo-lo-hi-lo
451295	AI557212	Hs.17132	ESTs, Moderately similar to I54374 gene	lo-lo-hi-lo
415443	T07353	Hs.7948	ESTs	lo-lo-hi-lo
422366	T83882	Hs.97927	ESTs	lo-lo-hi-lo
435163	AA668884	Hs.19155	ESTs	lo-lo-hi-lo
426559	AB001914	Hs.170414	paired basic amino acid cleaving system	lo-lo-hi-lo
448988	Y09763	Hs.22785	gamma-aminobutyric acid (GABA) A recepto	lo-lo-hi-lo
453655	AW960427	Hs.342874	transforming growth factor, beta recepto	lo-lo-hi-lo
414516	AI307802	Hs.135560	ESTs, Weakly similar to T43458 hypotheti	lo-lo-hi-lo
420028	AB014680	Hs.8786	carbohydrate (N-acetylglucosamine-6-O) s	lo-lo-hi-lo
430223	NM_002514	Hs.235935	nephroblastoma overexpressed gene	lo-lo-hi-lo
425887	AL049443	Hs.161283	Homo sapiens mRNA; cDNA DKFZp586N2020 (f	lo-lo-hi-lo
442577	AA292998	Hs.163900	ESTs	lo-lo-hi-lo
424940	AA985308	Hs.283902	ESTs	lo-lo-hi-lo
428839	AI767756	Hs.82302	Homo sapiens cDNA FLJ14814 fis, clone NT	lo-lo-hi-lo
443868	W88483	Hs.293650	Homo sapiens mRNA for RGPR-p117, complet	lo-lo-hi-lo
430334	AI824719	Hs.328700	ESTs	lo-lo-hi-lo
439686	W40445	Hs.235857	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
423754	NM_016181	Hs.132526	melanoma antigen	lo-lo-hi-lo
415205	H71616	Hs.135233	ESTs	lo-lo-hi-lo
426413	AA377823		gb:EST90805 Synovial sarcoma Homo sapien	lo-lo-hi-lo
407204	R41933	Hs.140237	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-lo-hi-lo
430234	N29317	Hs.236463	KIAA1238 protein	lo-lo-hi-lo
437143	AW204056	Hs.8917	ESTs	lo-lo-hi-hi
445162	AB011131	Hs.12376	piccolo (presynaptic cytomatrix protein)	lo-lo-hi-hi
415083	AI632683	Hs.27179	Homo sapiens cDNA FLJ12933 fis, clone NT	lo-lo-hi-hi
442924	AA533513	Hs.93659	protein disulfide isomerase related prot	lo-lo-hi-hi
429536	AA873016	Hs.206097	oncogene TC21	lo-lo-hi-hi
458584	AF217518	Hs.324136	PTD012 protein	lo-lo-hi-hi
419647	AA348947	Hs.91816	hypothetical protein	lo-lo-hi-hi
427201	AB037860	Hs.173933	nuclear factor I/A	lo-lo-hi-hi
428030	AI915228	Hs.11493	Homo sapiens cDNA FLJ13536 fis, clone PL	lo-lo-hi-hi
411779	AA292811	Hs.72050	non-metastatic cells 5, protein expresse	lo-lo-hi-hi
442482	NM_014039	Hs.8360	PTD012 protein	lo-lo-hi-hi
417458	NM_005655	Hs.82173	TGFB inducible early growth response	lo-lo-hi-hi
438021	AV653790	Hs.324275	WW domain-containing protein 1	lo-lo-hi-hi
409799	D11928	Hs.76845	phosphoserine phosphatase-like	lo-lo-hi-hi
440676	NM_004987	Hs.112378	LIM and senescent cell antigen-like doma	lo-lo-hi-hi
421437	AW821252	Hs.104336	hypothetical protein	lo-lo-hi-hi
456362	AW973003	Hs.179909	hypothetical protein FLJ22995	lo-lo-hi-hi
407686	AW901268	Hs.126043	chromosome 21 open reading frame 51	lo-lo-hi-hi
431129	AL137751	Hs.263671	Homo sapiens mRNA; cDNA DKFZp434I0812 (f	lo-lo-hi-hi
431874	AW610031	Hs.323914	translocase of inner mitochondrial membr	lo-lo-hi-hi
448072	AI459306	Hs.24908	ESTs	lo-lo-hi-hi
436860	H12751	Hs.5327	PRO1914 protein	lo-lo-hi-hi
448770	AA326683	Hs.21992	likely ortholog of mouse variant polyade	lo-lo-hi-hi
428044	AA093322	Hs.301404	RNA binding motif protein 3	lo-lo-hi-hi
451468	AW503398	Hs.293663	ESTs, Moderately similar to I38022 hypot	lo-lo-hi-hi
440278	BE560870	Hs.9052	ESTs, Weakly similar to 2004399A chromos	lo-lo-hi-hi
441102	AA973905		intermediate filament protein syncoilin	lo-lo-hi-hi
423942	AF209704	Hs.135723	glycolipid transfer protein	lo-lo-hi-hi
425254	U91985	Hs.105658	DNA fragmentation factor, 45 kD, alpha p	lo-lo-hi-hi
409324	W76202	Hs.343812	lipoic acid synthetase	lo-lo-hi-hi
431707	R21326	Hs.267905	hypothetical protein FLJ10422	lo-lo-hi-hi
423335	AB018337	Hs.127287	KIAA0794 protein	lo-lo-hi-hi
429200	AA447871	Hs.194215	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-hi
429898	AW117322	Hs.42366	ESTs	lo-lo-hi-hi
409604	AW444448	Hs.49124	ESTs	lo-lo-hi-hi
431797	BE169641	Hs.270134	hypothetical protein FLJ20280	lo-lo-hi-hi
437576	BE514383		prothymosin, alpha (gene sequence 28)	lo-lo-hi-hi
415992	C05837	Hs.145807	hypothetical protein FLJ13593	lo-lo-hi-hi
458537	W24704	Hs.54773	ESTs	lo-lo-hi-hi
417665	AW852858	Hs.22862	ESTs	lo-lo-hi-hi
422292	AI815733	Hs.114360	transforming growth factor beta-stimulat	lo-lo-hi-hi
421501	M29971	Hs.1384	O-6-methylguanine-DNA methyltransferase	lo-lo-hi-hi
457952	U25750		Human chromosome 17q21 mRNA clone 1046:1	lo-lo-hi-hi
414630	BE410857	Hs.16064	gb:601301177F1 NIH_MGC_21 Homo sapiens c	lo-lo-hi-hi
421990	T31811	Hs.110480	DC12 protein	lo-lo-hi-hi
404956			C1003210*:gi|6912582|ref|NP_036524.1| pe	lo-lo-hi-hi
436829	AW297958	Hs.163109	ESTs	lo-lo-hi-hi
402106	AK002178		hypothetical protein FLJ11316	lo-lo-hi-hi
404384			NM_020632*:Homo sapiens ATPase, H(+)-tra	lo-lo-hi-hi
445123	AI762911	Hs.145369	ESTs	lo-lo-hi-hi
401757			Target Exon	lo-lo-hi-hi
439502	AA836672	Hs.130694	ESTs	lo-lo-hi-hi

400111			Eos Control	lo-lo-hi-hi
405446	AI015709		Homo sapiens mRNA; cDNA DKFZp586I2022 (f	lo-lo-hi-hi
401563			C15001262:gi|7304981|ref|NP_038528.1| ca	lo-lo-hi-hi
402786			C1000887*:gi|12732453|ref|XP_011474.1| C	lo-lo-hi-hi
426484	AA379658	Hs.272759	KIAA1457 protein	lo-lo-hi-hi
414343	AL036166	Hs.323378	coated vesicle membrane protein	lo-lo-hi-hi
421970	AF227156	Hs.110103	RNA polymerase I transcription factor RR	lo-lo-hi-hi
422592	BE081857	Hs.94211	rcd1 (required for cell differentiation,	lo-lo-hi-hi
413431	AW246428	Hs.75355	ubiquitin-conjugating enzyme E2N (homolo	lo-lo-hi-hi
426746	J03626	Hs.2057	uridine monophosphate synthetase (orotat	lo-lo-hi-hi
400237			NM_001087*:Homo sapiens angio-associated	lo-lo-hi-hi
402532			Target Exon	lo-lo-hi-hi
402396			Target Exon	lo-lo-hi-hi
459649	AW298364	Hs.289292	ESTs	lo-lo-hi-hi
401512			NM_014080:Homo sapiens dual oxidase-like	lo-lo-hi-hi
448622	AL046508	Hs.270607	ESTs, Weakly similar to STK2_HUMAN SERIN	lo-lo-hi-hi
400501			ENSP00000251912*:KIAA1617 protein (Fragm	lo-lo-hi-hi
452324	W81486	Hs.58648	ESTs	lo-lo-hi-hi
453146	AI338952	Hs.32194	ESTs	lo-lo-hi-hi
430445	AW892432	Hs.65307	ESTs	lo-lo-hi-hi
401750			NM_012448*:Homo sapiens signal transduce	lo-lo-hi-hi
435236	T03890	Hs.157208	ESTs, Highly similar to ARX MOUSE HOMEOB	lo-lo-hi-hi
400375	NM_014115		NM_014115*:Homo sapiens PRO0113 protein	lo-lo-hi-hi
412151	AA100529	Hs.286232	Homo sapiens cDNA: FLJ23190 fis, clone L	lo-lo-hi-hi
410498	AA355749		gb:EST64459 Jurkat T-cells VI Homo sapie	lo-lo-hi-hi
405044			NM_014630*:Homo sapiens KIAA0211 gene pr	lo-lo-hi-hi
413169	AW161061	Hs.62954	ESTs, Weakly similar to zinc finger prot	lo-lo-hi-hi
402101			ENSP00000217725*:Laminin alpha-1 chain p	lo-lo-hi-hi
455019	AW850818		gb:IL3-CT0220-091199-026-A03 CT0220 Homo	lo-lo-hi-hi
446826	AK000626	Hs.16230	hypothetical protein FLJ20619	lo-lo-hi-hi
412180	AW898791	Hs.118837	gb:CM0-NN0075-130400-332-f06 NN0075 Homo	lo-lo-hi-hi
407273	AJ132560		gb:Homo sapiens mRNA for immunoblobulin	lo-lo-hi-hi
452895	BE389229	Hs.30954	phosphomevalonate kinase	lo-lo-hi-hi
416117	H19480	Hs.268787	ESTs	lo-lo-hi-hi
430934	AI792302	Hs.248141	potassium inwardly-rectifying channel, s	lo-lo-hi-hi
416309	R84694	Hs.79194	cAMP responsive element binding protein	lo-lo-hi-hi
444578	T80795	Hs.193702	ESTs	lo-lo-hi-hi
401966			C17000574:gi|8923190|ref|NP_060178.1| hy	lo-lo-hi-hi
444850	AW444882	Hs.148483	ESTs	lo-lo-hi-hi
403885			Target Exon	lo-lo-hi-hi
405435			Target Exon	lo-lo-hi-hi
422694	C06003	Hs.23782	hypothetical protein FLJ12847	lo-lo-hi-hi
422912	AW405973	Hs.11637	ESTs	lo-lo-hi-hi
412748	BE083158	Hs.10862	Homo sapiens cDNA: FLJ23313 fis, clone H	lo-lo-hi-hi
403704			Target Exon	lo-lo-hi-hi
440507	H06994		gb:yl81b07.r1 Soares infant brain 1NIB H	lo-lo-hi-hi
405503			C7000609*:gi|628012|pir||A53933 myosin I	lo-lo-hi-hi
456123	R00602		gb:ye74c04.r1 Soares fetal liver spleen	lo-lo-hi-hi
454261	AF216077	Hs.48376	Homo sapiens clone HB-2 mRNA sequence	lo-lo-hi-hi
458956	BE220675		gb:hl98f11.x1 NCI_CGAP_Lu24 Homo sapiens	lo-lo-hi-hi
418367	AA326035	Hs.59236	hypothetical protein DKFZp434L0718	lo-lo-hi-hi
444553	AI167530	Hs.149380	ESTs	lo-lo-hi-hi
405811			NM_024810:Homo sapiens hypothetical prot	lo-lo-hi-hi
429461	AI188219	Hs.99311	ESTs, Weakly similar to HSJ2_HUMAN DNAJ	lo-lo-hi-hi
423378	BE313601	Hs.164866	hypothetical protein FLJ22558	lo-lo-hi-hi
458516	BE010749	Hs.255097	ESTs	lo-lo-hi-hi
404039			ENSP00000247650*:Hypothetical 177.6 kDa	lo-lo-hi-hi
454148	AW732837	Hs.42390	nasopharyngeal carcinoma susceptibility	lo-lo-hi-hi
412678	AA115575	Hs.114914	ESTs	lo-lo-hi-hi
449298	AI911333	Hs.171689	ESTs	lo-lo-hi-hi
405525			NM_002439*:Homo sapiens mutS (E. coli) h	lo-lo-hi-hi
424576	BE154142	Hs 96833	ESTs	lo-lo-hi-hi
451601	N92100	Hs 97437	centrosomal protein 1	lo-lo-hi-hi
422395	AA310177	Hs.103931	DKFZP434B0335 protein	lo-lo-hi-hi
434333	AA186733	Hs 292154	stromal cell protein	lo-lo-hi-hi
413509	BE145419		gb:IL5-HT0198-291099-009-E01 HT0198 Homo	lo-lo-hi-hi
419504	AI088585	Hs.118904	ESTs	lo-lo-hi-hi
448586	AF285120	Hs.283734	CGI-204 protein	lo-lo-hi-hi
401209			C12000519:gi|7710046|ref|NP_057914.1| ki	lo-lo-hi-hi
423554	M90516	Hs.1674	glutamine-fructose-6-phosphate transamin	lo-lo-hi-hi
439803	AA001021	Hs.6685	thyroid hormone receptor interactor 8	lo-lo-hi-hi
424593	AA343729		gb:EST49730 Gall bladder I Homo sapiens	lo-lo-hi-hi
408122	AI432652	Hs.42824	hypothetical protein FLJ10718	lo-lo-hi-hi
409958	NM_001523	Hs.57697	hyaluronan synthase 1	lo-lo-hi-hi
408214	AL120445	Hs 77823	hypothetical protein FLJ21343	lo-lo-hi-hi
421911	AL041520		gb:DKFZp434G2317_s1 434 (synonym: htes3)	lo-lo-hi-hi
407813	AL120247	Hs 40109	KIAA0872 protein	lo-lo-hi-hi
425211	M18667	Hs.1867	progastricsin (pepsinogen C)	lo-lo-hi-hi
442772	AW503680	Hs.5957	Homo sapiens clone 24416 mRNA sequence	lo-lo-hi-hi
419733	AW362955	Hs.224961	Homo sapiens cDNA FLJ14415 fis, clone HE	lo-lo-hi-hi
428260	AW290886	Hs 86999	ESTs, Weakly similar to S65657 alpha-1C-	lo-lo-hi-hi
427083	NM_006363	Hs.173497	Sec23 (S. cerevisiae) homolog B	lo-lo-hi-hi

418583	AA604379	Hs.86211	hypothetical protein	lo-lo-hi-hi
407355	AA846203	Hs.193974	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-lo-hi-hi
454003	AA058944	Hs.116602	Homo sapiens, clone IMAGE:4154008, mRNA,	lo-lo-hi-hi
425322	U63630	Hs.155637	protein kinase, DNA-activated, catalytic	lo-lo-hi-hi
402240			Target Exon	lo-lo-hi-hi
421867	AA481078	Hs.109045	hypothetical protein FLJ10498	lo-lo-hi-hi
408603	R25283	Hs.326416	Homo sapiens mRNA; cDNA DKFZp564H1916 (f	lo-lo-hi-hi
437389	AL359587	Hs.271586	hypothetical protein DKFZp762M115	lo-lo-hi-hi
457148	AF091035	Hs.184627	KIAA0118 protein	lo-lo-hi-hi
400277			Eos Control	lo-lo-hi-hi
400995			C11000295*:gi|12737279|ref|XP_012163.1|	lo-lo-hi-hi
400818			Target Exon	lo-lo-hi-hi
402758			C1001899*:gi|12722636|ref|XP_010672.1| e	lo-lo-hi-hi
403708			Target Exon	lo-lo-hi-hi
405610			ENSP00000241065*:CDNA	lo-lo-hi-hi
414242	AA749230	Hs.26433	dolichyl-phosphate (UDP-N-acetylglucosam	lo-lo-hi-hi
420757	X78592	Hs.99915	androgen receptor (dihydrotestosterone r	lo-lo-hi-hi
400965			C11002190*:gi|12737279|ref|XP_012163.1|	lo-lo-hi-hi
401192			Target Exon	lo-lo-hi-hi
404407			Target Exon	lo-lo-hi-hi
401405			Target Exon	lo-lo-hi-hi
403055			C2002219*:gi|12737280|ref|XP_006682.2| k	lo-lo-hi-hi
404661			C9000306*:gi|12737280|ref|XP_006682.2| k	lo-lo-hi-hi
433627	AF078886	Hs.284296	Homo sapiens cDNA: FLJ22993 fis, clone K	lo-lo-hi-hi
410204	AJ243425	Hs.326035	early growth response 1	lo-lo-hi-hi
432642	BE297635	Hs.3069	heat shock 70kD protein 9B (mortalin-2)	lo-lo-hi-hi
400769			Target Exon	lo-lo-hi-hi
433980	AA137152	Hs.286049	phosphoserine aminotransferase	lo-lo-hi-hi
403725			Target Exon	lo-lo-hi-hi
413587	AA156164	Hs.286241	protein kinase, cAMP-dependent, regulato	lo-lo-hi-hi
422614	AI908006	Hs.295362	Homo sapiens cDNA FLJ14459 fis, clone HE	lo-lo-hi-hi
400275			NM_006513*:Homo sapiens seryl-tRNA synth	lo-lo-hi-hi
402810			NM_004930*:Homo sapiens capping protein	lo-lo-hi-hi
452049	BE268289	Hs.27693	peptidylprolyl isomerase (cyclophilin)-l	lo-lo-hi-hi
445677	H96577	Hs.6838	ras homolog gene family, member E	lo-lo-hi-hi
428770	AK001667	Hs.193128	hypothetical protein FLJ10805	lo-lo-hi-hi
428403	AI393048	Hs.326159	leucine rich repeat (in FLII) interactin	lo-lo-hi-hi
434647	W74158	Hs.103189	lipopolysaccharide specific response-68	lo-lo-hi-hi
402807			ENSP00000235229:SEMB.	lo-lo-hi-hi
413992	W26276	Hs.136075	RNA, U2 small nuclear	lo-lo-hi-hi
407191	AA608751		gb:ae56h07.s1 Stratagene lung carcinoma	lo-lo-hi-lo
403328			Target Exon	lo-lo-hi-hi
411984	NM_005419	Hs.72988	signal transducer and activator of trans	lo-lo-hi-lo
451017	BE391847	Hs.181173	hypothetical protein MGC10771	lo-lo-hi-hi
404108			C7000911*:gi|4235142|gb|AAD14470.1| (AC0	lo-lo-hi-hi
407819	R42185	Hs.102720	ESTs	lo-lo-hi-hi
435876	AW612586	Hs.160271	G protein-coupled receptor 48	lo-lo-hi-lo
436716	AI433540		gb:ti69g05.x1 NCI_CGAP_Kid11 Homo sapien	lo-lo-hi-hi
401419			Target Exon	lo-lo-hi-hi
424363	AW512144	Hs.346947	ESTs, Weakly similar to A48809 carboxyle	lo-lo-hi-hi
408866	AW292096	Hs.255036	ESTs	lo-lo-hi-hi
415516	F11411		gb:HSC2WF081 normalized infant brain cDN	lo-lo-hi-hi
423144	AW851527	Hs.253677	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-hi
452560	BE077084	Hs.99969	ESTs	lo-lo-hi-hi
439827	AA846538	Hs.187389	ESTs	lo-lo-hi-hi
419709	AA255592	Hs.347973	ESTs, Weakly similar to alternatively sp	lo-lo-hi-hi
413672	BE156536		gb:QV0-HT0368-310100-091-h10 HT0368 Homo	lo-lo-hi-hi
425291	AA354572		gb:EST62857 Jurkat T-cells V Homo sapien	lo-lo-hi-hi
427403	AA402107	Hs.257146	ESTs, Moderately similar to I38022 hypot	lo-lo-hi-hi
430911	AW937461	Hs.255377	ESTs	lo-lo-hi-hi
435293	AI040777	Hs.117170	ESTs	lo-lo-hi-hi
448490	AI523897	Hs.271692	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-hi
449539	W80363	Hs.58446	ESTs	lo-lo-hi-hi
458082	AW978811	Hs.314451	ESTs, Weakly similar to ALU1_HUMAN ALU S	lo-lo-hi-hi
459407	N92114		gb:za22h11.r1 Soares fetal liver spleen	lo-lo-hi-hi
423231	AA323486	Hs.271273	Homo sapiens cDNA FLJ12335 fis, clone MA	lo-lo-hi-hi
450628	AW382884	Hs.204715	ESTs	lo-lo-hi-hi
411690	AA669253	Hs.136075	RNA, U2 small nuclear	lo-lo-hi-hi
414739	U83867	Hs.77196	spectrin, alpha, non-erythrocytic 1 (alp	lo-lo-hi-hi
444169	AV648170	Hs.58756	ESTs	lo-lo-hi-hi
420911	U77413	Hs.100293	O-linked N-acetylglucosamine (GlcNAc) tr	lo-lo-hi-hi
422195	AB007903	Hs.113082	KIAA0443 gene product	lo-lo-hi-hi
452704	AA027823	Hs.149424	Homo sapiens PNAS-130 mRNA, complete cds	lo-lo-hi-hi
425074	AA495930		Homo sapiens cDNA: FLJ22165 fis, clone H	lo-lo-hi-hi
426376	N46752	Hs.302985	ESTs	lo-lo-hi-hi
447754	AW073310	Hs.163533	Homo sapiens cDNA FLJ14142 fis, clone MA	lo-lo-hi-hi
413686	AI469213	Hs.71404	ESTs	lo-lo-hi-hi
449000	U69560	Hs.3826	kelch-like protein C3IP1	lo-lo-hi-hi
430064	AK000091	Hs.231436	hypothetical protein FLJ20084	lo-lo-hi-hi
412205	N33818	Hs.20274	ESTs, Weakly similar to unnamed protein	lo-lo-hi-hi
423955	AI420582	Hs.136164	cutaneous T-cell lymphoma-associated tum	lo-lo-hi-hi
455619	BE063853		gb:QV3-BT0296-011299-022-g09 BT0296 Homo	lo-lo-hi-hi

408722	AA487860	Hs.298102	ESTs	lo-lo-hi-hi
459710	AI701596	Hs.121592	ESTs	lo-lo-hi-hi
417918	AA209205	Hs.163754	hypothetical protein FLJ12606	lo-lo-hi-hi
402964			NM_022095*:Homo sapiens hypothetical C2H	lo-lo-hi-hi
424387	AI739312	Hs.284163	ANKHZN protein	lo-lo-hi-hi
427220	AF069517	Hs.173993	RNA binding motif protein 6	lo-lo-hi-hi
410451	BE065687		gb:RC3-BT0316-270400-016-f10 BT0316 Homo	lo-lo-hi-hi
400713			NM_006165*:Homo sapiens nuclear factor r	lo-lo-hi-hi
407218	AA095473	Hs.28505	ubiquitin-conjugating enzyme E2H (homolo	lo-lo-hi-hi
449312	N71673	Hs.223666	ESTs	lo-lo-hi-hi
419612	AI498267	Hs.110613	KIAA0421 protein	lo-lo-hi-hi
455272	BE148152		gb:RC4-HT0231-041199-012-b04 HT0231 Homo	lo-lo-hi-hi
401839			NM_005177*:Homo sapiens ATPase, H+ trans	lo-lo-hi-hi
440422	AW452696	Hs.130760	myosin phosphatase, target subunit 2	lo-lo-hi-hi
436819	AA731746	Hs.120232	ESTs	lo-lo-hi-hi
413644	BE154910	Hs.278793	ESTs, Weakly similar to Z195_HUMAN ZINC	lo-lo-hi-hi
413939	AL047051	Hs.199961	ESTs, Weakly similar to ALU7_HUMAN ALU S	lo-lo-hi-hi
448198	BE622100	Hs.209406	ESTs, Weakly similar to I38600 zinc fing	lo-lo-hi-hi
450488	AA009999	Hs.59159	ESTs, Moderately similar to HPV16 E1 pro	lo-lo-hi-hi
433507	AI817336	Hs.191791	ESTs	lo-lo-hi-lo
438996	AW748336	Hs.110613	KIAA0421 protein	lo-lo-hi-lo
442789	AW904361	Hs.131191	ESTs, Weakly similar to ALU7_HUMAN ALU S	lo-lo-hi-lo
407251	U67611		transaldolase 1	lo-lo-hi-lo
409051	AA080912		gb:zn04d03.r1 Stratagene hNT neuron (937	lo-lo-hi-lo
409123	AA063403		gb:zm04d12.s1 Stratagene corneal stroma	lo-lo-hi-lo
416225	AA577730	Hs.188684	ESTs, Weakly similar to PC4259 ferritin	lo-lo-hi-lo
433735	AA608955	Hs.109653	ESTs	lo-lo-hi-lo
434404	AW445034	Hs.256578	ESTs	lo-lo-hi-lo
446667	BE161878	Hs.224805	ESTs	lo-lo-hi-lo
447982	H22953	Hs.137551	ESTs	lo-lo-hi-lo
438890	AA827756	Hs.135049	ESTs, Weakly similar to ALU7_HUMAN ALU S	lo-lo-hi-lo
427882	AA640987	Hs.193767	ESTs	lo-lo-hi-lo
459680	H96982	Hs.42321	ESTs	lo-lo-hi-lo
416832	H69480	Hs.141304	ESTs	lo-lo-hi-lo
453876	AW021748	Hs.110406	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
414528	AA148950	Hs.188836	ESTs	lo-lo-hi-lo
419902	AA804409	Hs.118920	ESTs	lo-lo-hi-lo
409542	AA503020	Hs.36563	hypothetical protein FLJ22418	lo-lo-hi-lo
433560	AI925195	Hs.130891	hypothetical protein MGC4400	lo-lo-hi-lo
447499	AW262580	Hs.147674	protocadherin beta 16	lo-lo-hi-lo
435023	AI692552		gb:wd73f12.x1 NCI_CGAP_Lu24 Homo sapiens	lo-lo-hi-lo
412156	H29487	Hs.17110	Homo sapiens mRNA; cDNA DKFZp434C2016 (f	lo-lo-hi-lo
414505	R45389	Hs.23558	ESTs, Weakly similar to A48042 lysosomal	lo-lo-hi-lo
404277			NM_019111*:Homo sapiens major histocompa	lo-lo-hi-lo
414662	AL036058	Hs.76807	major histocompatibility complex, class	lo-lo-hi-lo
444430	AI611153	Hs.6093	Homo sapiens cDNA: FLJ22783 fis, clone K	lo-lo-hi-lo
445612	N94126	Hs.12989	hypothetical protein	lo-lo-hi-lo
403739			ENSP00000251563*:UDP-glucuronosyltransfe	lo-lo-hi-lo
403740			NM_001076*:Homo sapiens UDP glycosyltran	lo-lo-hi-lo
411084	T18987	Hs.125472	ESTs, Moderately similar to KIAA0877 pro	lo-lo-hi-lo
429143	AA333327	Hs.197335	plasma glutamate carboxypeptidase	lo-lo-hi-lo
443060	D78874	Hs.8944	procollagen C-endopeptidase enhancer 2	lo-lo-hi-lo
422749	W01078	Hs.278573	CD59 antigen p18-20 (antigen identified	lo-lo-hi-lo
429441	AJ224172	Hs.204096	lipophilin B (uteroglobin family member)	lo-lo-hi-lo
414382	AW380339	Hs.8068	hematopoietic PBX-interacting protein	lo-lo-hi-lo
441560	F13388	Hs.7888	Homo sapiens clone 23736 mRNA sequence	lo-lo-hi-lo
446106	AA377165	Hs.44833	ESTs	lo-lo-hi-lo
452239	AW379378	Hs.170121	protein tyrosine phosphatase, receptor t	lo-lo-hi-lo
446874	AW968304	Hs.58156	ESTs	lo-lo-hi-lo
412795	BE241753	Hs.74592	special AT-rich sequence binding protein	lo-lo-hi-lo
430325	AF004562	Hs.239356	syntaxin binding protein 1	lo-lo-hi-lo
426392	AW968324	Hs.17384	ESTs	lo-lo-hi-lo
447448	BE244285		F-box only protein 29	lo-lo-hi-lo
415743	AA167664	Hs.14333	ESTs, Weakly similar to Z195_HUMAN ZINC	lo-lo-hi-lo
431607	AB033097	Hs.183669	KIAA1271 protein	lo-lo-hi-lo
411979	X85134	Hs.72984	retinoblastoma-binding protein 5	lo-lo-hi-lo
453620	BE396163	Hs.25005	ESTs, Weakly similar to ALU5_HUMAN ALU S	lo-lo-hi-lo
431099	Y13367	Hs.249235	phosphoinositide-3-kinase, class 2, alph	lo-lo-hi-lo
421687	AL035306	Hs.106823	hypothetical protein MGC14797	lo-lo-hi-lo
439565	AF086386	Hs.145599	ESTs	lo-lo-hi-lo
442349	W40516	Hs.132355	Homo sapiens cDNA: FLJ22119 fis, clone H	lo-lo-hi-lo
410096	AW245200	Hs.267400	hypothetical protein MGC5540	lo-lo-hi-lo
429447	AW812452	Hs.83286	ESTs, Weakly similar to S14747 sphingomy	lo-lo-hi-lo
431802	AL133570	Hs.270571	Homo sapiens mRNA; cDNA DKFZp434L201 (fr	lo-lo-hi-lo
441715	AI929453	Hs.342655	Homo sapiens cDNA FLJ13289 fis, clone OV	lo-lo-hi-lo
458230	BE311851	Hs.6639	KIAA1624 protein	lo-lo-hi-lo
428788	AF082283	Hs.193516	B-cell CLL/lymphoma 10	lo-lo-hi-lo
450818	AI740573	Hs.142827	F311 protein	lo-lo-hi-lo
419576	AK002060	Hs.91251	hypothetical protein FLJ11198	lo-lo-hi-lo
400401	AF159093		Homo sapiens endogenous retrovirus RAN1	lo-lo-hi-lo
427004	AI921573	Hs.213107	ESTs	lo-lo-hi-lo
401178	AA046772		RNA binding motif protein, X chromosome	lo-lo-hi-lo

423749	U09848	Hs.132390	zinc finger protein 36 (KOX 18)	lo-lo-hi-lo
428898	AB033070	Hs.194408	KIAA1244 protein	lo-lo-hi-lo
458258	AW406546	Hs.127971	ESTs	lo-lo-hi-lo
429521	BE048708	Hs.50949	ESTs	lo-lo-hi-lo
402185			Target Exon	lo-lo-hi-lo
415961	H10983	Hs.155919	ESTs	lo-lo-hi-lo
457265	AB023212	Hs.225967	KIAA0995 protein	lo-lo-hi-lo
412419	AW948630		gb:QV0-FT0001-050500-226-g05 FT0001 Homo	lo-lo-hi-lo
438397	AA806478	Hs.123206	ESTs	lo-lo-hi-lo
440509	BE410132	Hs.134202	ESTs, Weakly similar to T17279 hypotheti	lo-lo-hi-lo
423895	AA332215		gb:EST36124 Embryo, 8 week I Homo sapien	lo-lo-hi-lo
400251			NM_004651*:Homo sapiens ubiquitin specif	lo-lo-hi-lo
445094	AW296163	Hs.147296	ESTs	lo-lo-hi-lo
432323	AK001409	Hs.274356	hypothetical protein FLJ10547	lo-lo-hi-lo
444290	AA262496		gb:zs20f11.r1 NCI_CGAP_GCB1 Homo sapiens	lo-lo-hi-lo
435803	Z44194	Hs.4994	transducer of ERBB2, 2	lo-lo-hi-lo
436905	N31273	Hs.42380	ESTs	lo-lo-hi-lo
401849			Target Exon	lo-lo-hi-lo
402249			C19000553*:gi|12741444|ref|XP_008888.2|	lo-lo-hi-lo
406180	AB018249		small inducible cytokine subfamily A (Cy	lo-lo-hi-lo
448176	AI672546	Hs.170507	ESTs	lo-lo-hi-lo
409259	AW608930	Hs.52184	hypothetical protein FLJ20618	lo-lo-hi-lo
457335	AW969834	Hs.303303	ESTs	lo-lo-hi-lo
452444	BE144022		gb:MR0-HT0165-191199-004-f05 HT0165 Homo	lo-lo-hi-lo
405429			Target Exon	lo-lo-hi-lo
430103	AA465259		gb:aa33b03.r1 NCI_CGAP_GCB1 Homo sapiens	lo-lo-hi-lo
439944	AA856767	Hs.124623	ESTs	lo-lo-hi-lo
411283	AW852754		gb:PM1-CT0247-180100-009-c05 CT0247 Homo	lo-lo-hi-lo
458195	R10085	Hs.130370	ESTs	lo-lo-hi-lo
452654	BE004783		gb:MR2-BN0114-270400-004-e11 BN0114 Homo	lo-lo-hi-lo
425884	AF000989	Hs.159201	thymosin, beta 4, Y chromosome	lo-lo-hi-lo
429452	AI949495	Hs.133998	Homo sapiens cDNA FLJ13202 fis, clone NT	lo-lo-hi-lo
431709	AF220185	Hs.267923	uncharacterized hypothalamus protein HT0	lo-lo-hi-lo
411701	BE181659		gb:QV1-HT0638-070500-191-g07 HT0638 Homo	lo-lo-hi-lo
430729	AI572560	Hs.301283	KIAA0793 gene product	lo-lo-hi-lo
447476	BE293466	Hs.20880	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
450436	AW293661	Hs.131887	ESTs	lo-lo-hi-lo
405365			CX001212*:gi|7861932|gb|AAF70445.1| (AF2	lo-lo-hi-lo
419555	AA244416		gb:nc07d11.s1 NCI_CGAP_Pr1 Homo sapiens	lo-lo-hi-lo
446103	U90918	Hs.13804	hypothetical protein dJ462O23.2	lo-lo-hi-lo
400986			NM_024085*:Homo sapiens hypothetical pro	lo-lo-hi-lo
424194	BE245833	Hs.169854	gb:TCBAP1E1908 Pediatric pre-B cell acut	lo-lo-hi-lo
400210			Eos Control	lo-lo-hi-lo
400234			NM_005336:Homo sapiens high density lipo	lo-lo-hi-lo
400235			NM_005336:Homo sapiens high density lipo	lo-lo-hi-lo
405387			NM_022170*:Homo sapiens Williams-Beuren	lo-lo-hi-lo
433075	NM_002959		sortilin 1	lo-lo-hi-lo
406302			C16000922:gi|7499103|pir||T20903 hypothe	lo-lo-hi-lo
428181	AA423976		gb:zv62h06.s1 Soares_testis_NHT Homo sap	lo-lo-hi-lo
456629	AW891965	Hs.279789	histone deacetylase 3	lo-lo-hi-lo
426940	AA393537	Hs.98347	ESTs, Weakly similar to JC5308 testis-sp	lo-lo-hi-lo
433555	AA535902	Hs.146211	Homo sapiens HERC2P7 pseudogene, partial	lo-lo-hi-lo
421431	AA650117	Hs.283107	ESTs	lo-lo-hi-lo
448631	AI554923		gb:te53h12.x1 Soares_NFL_T_GBC_S1 Homo s	lo-lo-hi-lo
433521	T66087	Hs.112482	Homo sapiens unknown mRNA sequence	lo-lo-hi-lo
407187	AA446971		gb:zw85f11.s1 Soares_total_fetus_Nb2HF8_	lo-lo-hi-lo
450739	AI732707	Hs.116506	ESTs, Weakly similar to ALU7_HUMAN ALU S	lo-lo-hi-lo
440004	BE397117	Hs.120824	hypothetical protein FLJ21845	lo-lo-hi-lo
403947	NM_005032		plastin 3 (T isoform)	lo-lo-hi-lo
405529	AW410458		chromosome 11 open reading frame2	lo-lo-hi-lo
402163			C19001075*:gi|4567179|gb|AAD23607.1|AC00	lo-lo-hi-lo
404663			ENSP00000251884:KIAA1521 protein (Fragme	lo-lo-hi-lo
400220			Eos Control	lo-lo-hi-lo
401444			Target Exon	lo-lo-hi-lo
455824	BE143703		gb:MR0-HT0164-191199-004-f03 HT0164 Homo	lo-lo-hi-lo
400206			Eos Control	lo-lo-hi-lo
458659	AW749895	Hs.332520	Homo sapiens mRNA; cDNA DKFZp434A1014 (f	lo-lo-hi-lo
428666	AL080190	Hs.189242	Homo sapiens mRNA; cDNA DKFZp434A202 (fr	lo-lo-hi-lo
428442	AA428638	Hs.98606	ESTs	lo-lo-hi-lo
440151	AA868167		gb:ak38e07.s1 Soares_testis_NHT Homo sap	lo-lo-hi-lo
431046	AW854382	Hs.249126	Homo sapiens clone 24894 mRNA sequence	lo-lo-hi-lo
443914	AI091173	Hs.222362	ESTs, Weakly similar to p40 [H.sapiens]	lo-lo-hi-lo
402469			Target Exon	lo-lo-hi-lo
418155	R45481	Hs.23719	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
446893	AI610818	Hs.7110	ESTs	lo-lo-hi-lo
442336	AW340958	Hs.7572	ESTs	lo-lo-hi-lo
421290	NM_014368	Hs.103137	LIM homeobox protein 6	lo-lo-hi-lo
450374	AA397540	Hs.60293	Homo sapiens clone 122482 unknown mRNA	lo-lo-hi-lo
402347			Target Exon	lo-lo-hi-lo
415184	AA380436	Hs.211973	homolog of Yeast RRP4 (ribosomal RNA pro	lo-lo-hi-lo
415632	U67085	Hs.78524	TcD37 homolog	lo-lo-hi-lo
423718	AL119520	Hs.180737	Homo sapiens clone 23664 and 23905 mRNA	lo-lo-hi-lo

449140	AW013840	Hs.202092	ESTs	lo-lo-hi-lo
431241	AA496799	Hs.36958	ESTs	lo-lo-hi-lo
416631	H69466		gb:yr88f07.r1 Soares fetal liver spleen	lo-lo-hi-lo
424168	L29277	Hs.321677	signal transducer and activator of trans	lo-lo-hi-lo
401600	BE247275		U5 snRNP-specific protein, 116 kD	lo-lo-hi-lo
420588	AF000982	Hs.147916	DEAD/H (Asp-Glu-Ala-Asp/His) box polypep	lo-lo-hi-lo
414111	BE047679	Hs.152982	hypothetical protein FLJ13117	lo-lo-hi-lo
417138	AA193646	Hs.65771	Homo sapiens chromosome 19, BAC CIT-HSPC	lo-lo-hi-lo
424318	AA476515	Hs.172723	ESTs	lo-lo-hi-lo
455653	BE154075		gb:PM0-HT0339-200400-010-E05 HT0339 Homo	lo-lo-hi-lo
451493	H38656	Hs.32854	ESTs	lo-lo-hi-lo
457015	AA688058	Hs.261544	ESTs	lo-lo-hi-lo
403654			NM_003071:Homo sapiens SWI/SNF related,	lo-lo-hi-lo
435203	AW957127	Hs.294027	ESTs	lo-lo-hi-lo
409322	BE091159	Hs.22687	ESTs, Moderately similar to unnamed prot	lo-lo-hi-lo
437764	AA767795	Hs.166832	ESTs	lo-lo-hi-lo
432542	AW083920	Hs.16098	claudin 2	lo-lo-hi-lo
436125	AA765895	Hs.152895	ESTs	lo-lo-hi-lo
403217	AL134878		ribosomal protein, large P2	lo-lo-hi-lo
434023	AI277883	Hs.146141	ESTs	lo-lo-hi-lo
442419	AI749893	Hs.270532	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
443667	AI129066	Hs.135457	ESTs	lo-lo-hi-lo
451445	AA017609	Hs.343449	gb:ze37e01.r1 Soares retina N2b4HR Homo	lo-lo-hi-lo
454775	BE160229		gb:QV1-HT0413-090200-062-a12 HT0413 Homo	lo-lo-hi-lo
411053	AW815061		gb:CM0-ST0209-271099-082-d10 ST0209 Homo	lo-lo-hi-lo
435312	AJ243396	Hs.4865	voltage-gated sodium channel beta-3 subu	lo-lo-hi-lo
450875	AK000724	Hs.301553	karyopharin alpha 6 (importin alpha 7)	lo-lo-hi-lo
451180	H61899	Hs.171937	steroid dehydrogenase-like	lo-lo-hi-lo
427327	AW501456	Hs.288283	Homo sapiens cDNA: FLJ22355 fis, clone H	lo-lo-hi-lo
444321	AW204210	Hs.122275	Homo sapiens mRNA; cDNA DKFZp564N1623 (f	lo-lo-hi-lo
405109	N47812		CGI-35 protein	lo-lo-hi-lo
450182	AI796400	Hs.240767	Human DNA sequence from clone RP1-12G14	lo-lo-hi-lo
424990	AU076896	Hs.154095	zinc finger protein 143 (clone pHZ-1)	lo-lo-hi-lo
428997	AF065391	Hs.194718	zinc finger protein 265	lo-lo-hi-lo
402602			NM_021186*:Homo sapiens zona pellucida g	lo-lo-hi-lo
428772	AI524039	Hs.192524	ESTs	lo-lo-hi-lo
423759	AI142358	Hs.184381	ESTs, Moderately similar to ALU7_HUMAN A	lo-lo-hi-lo
434350	AL042940	Hs.93872	KIAA1682 protein	lo-lo-hi-lo
442274	AI733484	Hs.129182	ESTs	lo-lo-hi-lo
442884	AI076570	Hs.134053	ESTs	lo-lo-hi-lo
400481			Target Exon	lo-lo-hi-lo
407283	T51008		gb:yb55e08.s1 Stratagene ovary (937217)	lo-lo-hi-lo
408859	AW291872	Hs.258981	ESTs	lo-lo-hi-lo
455615	BE045344	Hs.274923	ESTs, Moderately similar to unnamed prot	lo-lo-hi-lo
427315	AA179949	Hs.175563	Homo sapiens mRNA; cDNA DKFZp564N0763 (f	lo-lo-hi-lo
449375	R07114	Hs.271224	ESTs	lo-lo-hi-lo
419937	AB040959	Hs.93836	DKFZP434N014 protein	lo-lo-hi-lo
422231	AA443512	Hs.101383	ESTs	lo-lo-hi-lo
437210	AA311443	Hs.293563	Homo sapiens mRNA; cDNA DKFZp586E2317 (f	lo-lo-hi-lo
418056	AA524886		gb:nh34f02.s1 NCI_CGAP_Pr3 Homo sapiens	lo-lo-hi-lo
446586	N58790	Hs.268820	ESTs	lo-lo-hi-lo
407949	W21874	Hs.247057	ESTs, Weakly similar to 2109260A B cell	lo-lo-hi-lo
440296	D30829	Hs.180610	splicing factor proline/glutamine rich (	lo-lo-hi-lo
422260	AA315993	Hs.105484	regenerating gene type IV	lo-lo-hi-lo
434685	AA642445	Hs.287467	Homo sapiens cDNA FLJ11948 fis, clone HE	lo-lo-hi-lo
412657	AW976165		gb:EST388274 MAGE resequences, MAGN Homo	lo-lo-hi-lo
405188			Target Exon	lo-lo-hi-lo
416954	AI222358		gb:qh04c12.x1 Soares_NFL_T_GBC_S1 Homo s	lo-lo-hi-lo
423700	AA232375	Hs.58606	SNRPN upstream reading frame	lo-lo-hi-lo
430288	BE394943	Hs.13804	hypothetical protein dJ462O23.2	lo-lo-hi-lo
435184	T67182	Hs.135127	ESTs, Weakly similar to unnamed protein	lo-lo-hi-lo
431475	AI567669	Hs.40342	putative nuclear protein	lo-lo-hi-lo
445239	AI217375	Hs.170023	ESTs, Weakly similar to CA36_HUMAN COLLA	lo-lo-hi-lo
436151	AK000801	Hs.324271	Homo sapiens cDNA FLJ20794 fis, clone CO	lo-lo-hi-lo
448489	AI523875		gb:tg97d04.x1 NCI_CGAP_CLL1 Homo sapiens	lo-lo-hi-lo
424470	BE244261	Hs.323502	Homo sapiens cDNA: FLJ23539 fis, clone L	lo-lo-hi-lo
434733	AI334367	Hs.159337	ESTs	lo-lo-hi-lo
409469	AW517236	Hs.335762	ESTs	lo-lo-hi-lo
414034	U89277	Hs.305985	early development regulator 1 (homolog o	lo-lo-hi-lo
420382	AW959165	Hs.270034	Homo sapiens, Similar to nuclear localiz	lo-lo-hi-lo
430433	AA478883	Hs.273766	ESTs	lo-lo-hi-lo
435351	T80177	Hs.118064	similar to rat nuclear ubiquitous casein	lo-lo-hi-lo
403218	AL134878		ribosomal protein, large P2	lo-lo-hi-lo
420678	AW593288	Hs.3530	TLS-associated serine-arginine protein 2	lo-lo-hi-lo
445808	AV655234		ESTs, Moderately similar to PC4259 ferri	lo-lo-hi-lo
429933	AA765596	Hs.187691	ESTs	lo-lo-hi-lo
419802	AA250950	Hs.154334	ESTs	lo-lo-hi-lo
425155	W26522	Hs.75890	gb:32g2 Human retina cDNA randomly prime	lo-lo-hi-lo
417314	N68168		gb:za11c01.s1 Soares fetal liver spleen	lo-lo-hi-lo
428290	AI932995	Hs.183475	Homo sapiens clone 25061 mRNA sequence	lo-lo-hi-lo
422128	AW881145		gb:QV0-OT0033-010400-182-a07 OT0033 Homo	lo-lo-hi-lo
432014	H66741	Hs.38540	ESTs, Weakly similar to ALU4_HUMAN ALU S	lo-lo-hi-lo

407351	AW383165		gb:PM3-HT0344-151299-004-f07 HT0344 Homo	lo-lo-hi-lo
443231	W87548	Hs.132932	ESTs	lo-lo-hi-lo
444001	AI095087	Hs.152299	ESTs, Moderately similar to S65657 alpha	lo-lo-hi-lo
435064	T70740	Hs.31433	ESTs	lo-lo-hi-lo
435173	AW295645	Hs.255451	ESTs	lo-lo-hi-lo
411831	AW994394		gb:RC3-BN0036-060400-014-h12 BN0036 Homo	lo-lo-hi-lo
446572	AV659151	Hs.282961	ESTs	lo-lo-hi-lo
428114	AI821548	Hs.98363	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
406207			Target Exon	lo-lo-hi-lo
405011			Target Exon	lo-lo-hi-lo
409451	AF012626	Hs.54472	fragile X mental retardation 2	lo-lo-hi-lo
411233	AW833793		gb:QV4-TT0008-130100-080-a06 TT0008 Homo	lo-lo-hi-lo
455729	BE072092		gb:PM4-BT0532-160200-003-b11 BT0532 Homo	lo-lo-hi-lo
439454	AA836120	Hs.258958	ESTs	lo-lo-hi-lo
445124	AI806403	Hs.143942	ESTs	lo-lo-hi-lo
410324	AW292539	Hs.30177	ESTs	lo-lo-hi-lo
446548	AI769392	Hs.200215	ESTs	lo-lo-hi-lo
416999	AW195747	Hs.21122	hypothetical protein FLJ11830 similar to	lo-lo-hi-lo
414553	AI813865	Hs.164478	hypothetical protein FLJ21939 similar to	lo-lo-hi-lo
444647	H14718	Hs.11506	Human clone 23589 mRNA sequence	lo-lo-hi-lo
418271	NM_000919	Hs.83920	peptidylglycine alpha-amidating monooxyg	lo-lo-hi-lo
407939	W05608	Hs.312679	ESTs, Weakly similar to A49019 dynein he	lo-lo-hi-lo
432676	AI187366		gb:qf29c01.x1 Soares_testis_NHT Homo sap	lo-lo-hi-lo
415156	X84908	Hs.78060	phosphorylase kinase, beta	lo-lo-hi-lo
432679	AI146956	Hs.146723	ESTs, Weakly similar to A53950 transcrip-	lo-lo-hi-lo
412121	AB033061	Hs.73287	KIAA1235 protein	lo-lo-hi-lo
418858	AW961605	Hs.21145	hypothetical protein RG083M05.2	lo-lo-hi-lo
425204	NM_002436	Hs.1861	membrane protein, palmitoylated 1 (55kD)	lo-lo-hi-lo
418348	AI537167	Hs.96322	hypothetical protein FLJ23560	lo-lo-hi-lo
410765	AI694972	Hs.66180	nucleosome assembly protein 1-like 2	lo-lo-hi-lo
445594	AW058463	Hs.12940	zinc-fingers and homeoboxes 1	lo-lo-hi-lo
416503	H98502	Hs.269853	ESTs	lo-lo-hi-lo
426167	AF039023	Hs.167496	RAN binding protein 6	lo-lo-hi-lo
451752	AB032997	Hs.26966	KIAA1171 protein	lo-lo-hi-lo
447124	AW976438	Hs.17428	RBP1-like protein	lo-lo-hi-lo
419872	AI422951	Hs.146162	ESTs	lo-lo-hi-lo
443161	AI038316		gb:ox48c08.x1 Soares_total_fetus_Nb2HF8_	lo-lo-hi-lo
445391	T92576	Hs.191168	ESTs	lo-lo-hi-lo
443801	AW206942	Hs.253594	intron of: trichorhinophalangeal syndro	lo-lo-hi-lo
446706	AW807631	Hs.190488	Homo sapiens, Similar to nuclear localiz	lo-lo-hi-lo
428172	U09367	Hs.182828	zinc finger protein 136 (clone pHZ-20)	lo-lo-hi-lo
421021	AA808018	Hs.109302	ESTs	lo-lo-hi-lo
431749	AL049263	Hs.306292	Homo sapiens mRNA; cDNA DKFZp564F133 (fr	lo-lo-hi-lo
423784	AK000039	Hs.132826	Homo sapiens cDNA FLJ14913 fis, clone PL	lo-lo-hi-lo
419479	AI288348	Hs.23450	mitochondrial ribosomal protein S25	lo-lo-hi-lo
450900	H61005	Hs.37902	ESTs	lo-lo-hi-lo
423396	AI382555	Hs.127950	bromodomain-containing 1	lo-lo-hi-lo
426137	AL040683	Hs.167031	DKFZP566D133 protein	lo-lo-hi-lo
442012	AI733277	Hs.128321	ESTs	lo-lo-hi-lo
452271	AA025976	Hs.34569	ESTs	lo-lo-hi-lo
414882	D79994	Hs.77546	Homo sapiens cDNA: FLJ21983 fis, clone H	lo-lo-hi-lo
432195	AJ243669	Hs.8127	KIAA0144 gene product	lo-lo-hi-lo
430217	N47863	Hs.180450	ribosomal protein S24	lo-lo-hi-lo
429567	R35606	Hs.326800	Human EST clone 53125 mariner transposon	lo-lo-hi-lo
438810	AW897846	Hs.6421	hypothetical protein DKFZp761N09121	lo-lo-hi-lo
436796	BE515260	Hs.5320	hypothetical protein	lo-lo-hi-lo
426352	N72324	Hs.55098	ESTs	lo-lo-hi-lo
415308	F05251		gb:HSC04H101 normalized infant brain cDN	lo-lo-hi-lo
420148	U34227	Hs.95361	myosin VIIA (Usher syndrome 1B (autosoma	lo-lo-hi-lo
434442	AA737415	Hs.152826	ESTs	lo-lo-hi-lo
449429	AA054224	Hs.59847	ESTs	lo-lo-hi-lo
410245	C17908	Hs.194125	ESTs	lo-lo-hi-lo
421168	AF182277	Hs.330780	cytochrome P450, subfamily IIB (phenobar	lo-lo-hi-lo
436237	R11528	Hs.271968	ESTs	lo-lo-hi-lo
440668	AI989538	Hs.191074	ESTs	lo-lo-hi-lo
422068	AI807519	Hs.104520	Homo sapiens cDNA FLJ13694 fis, clone PL	lo-lo-hi-lo
410216	BE061839		gb:RC1-BT0254-290100-015-a05 BT0254 Homo	lo-lo-hi-lo
439437	AI207788	Hs.343628	sialyltransferase 4B (beta-galactosidase	lo-lo-hi-lo
417061	AI675944	Hs.188691	Homo sapiens cDNA FLJ12033 fis, clone HE	lo-lo-hi-lo
403046			NM_005656*:Homo sapiens transmembrane pr	lo-lo-hi-lo
404528	AI912555		peptide YY, 2 (seminalplasmin)	lo-lo-hi-lo
439734	AC005013	Hs.149	cAMP response element-binding protein CR	lo-lo-hi-lo
452997	N64777	Hs.44656	ESTs	lo-lo-hi-lo
403745			ENSP00000226812*:KIAA1494 protein (Fragm	lo-lo-hi-lo
411448	AA178955	Hs.271439	ESTs, Weakly similar to I38022 hypotheti	lo-lo-hi-lo
422460	AW445014	Hs.197746	ESTs	lo-lo-hi-lo
404058			Target Exon	lo-lo-hi-lo
436184	BE154067	Hs.136660	ESTs, Weakly similar to ZN91_HUMAN ZINC	lo-lo-hi-lo
427702	N76589	Hs.14454	ESTs, Weakly similar to TFIID subunit TA	lo-lo-hi-lo
440695	AW088363	Hs.246240	ESTs	lo-lo-hi-lo
424881	AL119690	Hs.153618	HCGVIII-1 protein	lo-lo-hi-hi
440573	BE550891	Hs.270624	ESTs	lo-lo-hi-hi

416659	W22048	Hs.64753	gb:61A12 Human retina cDNA Tsp509I-cleav	lo-lo-hi-hi
436731	AA580691	Hs.180789	S164 protein	lo-lo-hi-hi
405102			C15001220*:gi|4469558|gb|AAD21311.1| (AF	lo-lo-hi-hi
450219	AI826999	Hs.224624	ESTs	lo-lo-hi-hi
404527	AI912555		peptide YY, 2 (seminalplasmin)	lo-lo-hi-hi
439158	R60323	Hs.193888	ESTs	lo-lo-hi-hi
431952	Z70695	Hs.272240	Homo sapiens cDNA FLJ11086 fis, clone PL	lo-lo-hi-hi
418584	NM_004606	Hs.1179	TATA box binding protein (TBP)-associate	lo-lo-hi-hi
424241	AW995948	Hs.182339	Homo sapiens pyruvate dehydrogenase kina	lo-lo-hi-hi
410124	AW962229	Hs.128927	Homo sapiens cDNA FLJ13903 fis, clone TH	lo-lo-hi-hi
435955	AA830515	Hs.222917	ESTs	lo-lo-hi-hi
424001	W67883	Hs.137476	paternally expressed 10	hi-hi-lo-lo
441399	AI630844	Hs.126919	ESTs	hi-hi-lo-lo
440184	AB002297	Hs.7022	dedicator of cyto-kinesis 3	hi-hi-lo-lo
421996	AW583807	Hs.1460	glucagon	hi-hi-lo-lo
444252	R21135	Hs.54985	ESTs	hi-hi-lo-lo
402082			C18000743*:gi|6678363|ref|NP_033416.1| t	hi-hi-lo-lo
405396			C22000452*:gi|6981522|ref|NP_036781.1| r	hi-hi-lo-lo
412457	T32587	Hs.170414	paired basic amino acid cleaving system	hi-hi-lo-lo
415808	R21439	Hs.334578	Homo sapiens, clone IMAGE:3929520, mRNA	hi-hi-lo-lo
441494	AW452344	Hs.129977	ESTs	hi-hi-lo-lo
437330	AL353944	Hs.50115	Homo sapiens mRNA; cDNA DKFZp781J1112 (f	hi-hi-lo-lo
452784	BE463857	Hs.151258	hypothetical protein FLJ21062	hi-hi-lo-lo
410037	AB020725	Hs.58009	KIAA0918 protein	hi-hi-lo-lo
449145	AI632122	Hs.198408	ESTs	hi-hi-lo-lo
452487	AW207659	Hs.6630	Homo sapiens cDNA FLJ13329 fis, clone OV	hi-hi-lo-lo
431031	AA830335	Hs.105273	ESTs	hi-hi-lo-lo
427209	H06509	Hs.92423	KIAA1566 protein	hi-hi-lo-lo
434280	BE005398		gb:CM1-BN0116-150400-189-h02 BN0116 Homo	hi-hi-lo-lo
418236	AW994005	Hs.337534	ESTs	hi-hi-lo-lo
429201	X03178	Hs.198246	group-specific component (vitamin D bind	hi-hi-lo-lo
416653	AA768553	Hs.193145	metallothionein 1E (functional)	hi-hi-lo-lo
422501	AA354690	Hs.144967	ESTs	hi-hi-lo-lo
425087	R62424	Hs.126059	ESTs	hi-hi-lo-lo
426798	AA385062	Hs.130260	ESTs	hi-hi-lo-lo
443798	R07848	Hs.188522	ESTs	hi-hi-lo-lo
427254	AL121523	Hs.97774	ESTs	hi-hi-lo-lo
431657	AI345227	Hs.105448	ESTs, Weakly similar to B34087 hypotheti	hi-hi-lo-lo
409963	AA133590	Hs.250857	calcium/calmodulin-dependent protein kin	hi-hi-lo-lo
448006	NM_004403	Hs.13530	deafness, autosomal dominant 5	hi-hi-lo-lo
418259	AA215404		ESTs	hi-hi-lo-lo
410173	AA706017	Hs.119944	ESTs	hi-hi-lo-lo
438023	T81819	Hs.302251	ESTs	hi-hi-lo-lo
448428	AF282874	Hs.21201	nectin 3; DKFZP566B0846 protein	hi-hi-lo-lo
430665	BE350122	Hs.157367	ESTs, Weakly similar to I78885 serine/th	hi-hi-lo-lo
432559	AW452948	Hs.257831	ESTs	hi-hi-lo-lo
451572	AA018556	Hs.268691	ESTs, Moderately similar to ALU2_HUMAN A	hi-hi-lo-lo
456032	AW957446	Hs.301711	ESTs	hi-hi-lo-lo
438209	AL120859	Hs.8111	aryl-hydrocarbon receptor nuclear transl	hi-hi-lo-lo
438337	AK002058	Hs.6166	hypothetical protein FLJ11196	hi-hi-lo-lo
431795	AK002088	Hs.270124	Homo sapiens cDNA FLJ11226 fis, clone PL	hi-hi-lo-lo
421114	AW975051	Hs.293158	ESTs, Weakly similar to I78885 serine/th	hi-hi-lo-lo
431843	AA516420		ESTs, Weakly similar to I38022 hypotheti	hi-hi-lo-lo
440948	AW188311	Hs.128619	ESTs	hi-hi-lo-lo
430105	X70297	Hs.2540	cholinergic receptor, nicotinic, alpha p	hi-hi-lo-lo
439046	AA947354		gb:od86e11.s1 NCI_CGAP_Ov2 Homo sapiens	hi-hi-lo-lo
451491	AI972094	Hs.286221	Homo sapiens cDNA FLJ13741 fis, clone PL	hi-hi-lo-lo
452789	AW081626	Hs.242561	ESTs	hi-hi-lo-lo
419829	AI924228	Hs.115185	ESTs, Moderately similar to PC4259 ferri	hi-hi-lo-lo
449567	AI990790	Hs.188614	ESTs	hi-hi-lo-lo
407787	N21307	Hs.13477	ESTs, Weakly similar to 1207289A reverse	hi-hi-lo-lo
409091	AW970386	Hs.269423	ESTs	hi-hi-lo-lo
435354	AA678267	Hs.117115	ESTs	hi-hi-lo-lo
444809	BE207568	Hs.208219	oculospanin	hi-hi-lo-lo
422170	AI791949	Hs.112432	anti-Mullerian hormone	hi-hi-lo-lo
453582	AW854339	Hs.33476	hypothetical protein FLJ11937	hi-hi-lo-lo
435905	AW997484	Hs.5003	KIAA0456 protein	hi-hi-lo-lo
443884	N20617	Hs.194397	leptin receptor	hi-hi-lo-lo
430027	AB023197	Hs.227743	KIAA0980 protein	hi-hi-lo-lo
432582	AI623817	Hs.168457	ESTs	hi-hi-lo-lo
417993	AW963705	Hs.301183	molecule possessing ankyrin repeats indu	hi-hi-lo-lo
444930	BE185536	Hs.301183	molecule possessing ankyrin repeats indu	hi-hi-lo-lo
427794	AA709186	Hs.99070	ESTs	hi-hi-lo-lo
410913	AL050367	Hs.66762	Homo sapiens mRNA; cDNA DKFZp564A026 (fr	hi-hi-lo-lo
431992	NM_002742	Hs.2891	protein kinase C, mu	hi-hi-lo-lo
447846	AA324057	Hs.77955	Homo sapiens cDNA: FLJ23527 fis, clone L	hi-hi-lo-lo
430439	AL133561		DKFZP434B061 protein	hi-hi-lo-lo
432621	AI298501	Hs.12807	ESTs, Weakly similar to T46428 hypotheti	hi-hi-lo-lo
431427	AK000401	Hs.252748	Homo sapiens cDNA FLJ20394 fis, clone KA	hi-hi-lo-lo
408872	AI476139	Hs.13291	ESTs	hi-hi-lo-lo
453200	AA033832	Hs.212433	ESTs	hi-hi-lo-lo
411529	AA430348	Hs.317596	Homo sapiens cDNA FLJ12927 fis, clone NT	hi-hi-lo-lo

414483	R25513	Hs.10683	ESTs	hi-hi-lo-lo
451273	NM_014811	Hs.26163	KIAA0649 gene product	hi-hi-lo-lo
437052	AA861697	Hs.120591	ESTs	hi-hi-lo-lo
440049	R06699	Hs.19769	hypothetical protein MGC4174	hi-hi-lo-lo
429483	AA974832	Hs.128708	ESTs	hi-hi-lo-lo
411296	BE207307	Hs.10114	growth suppressor 1	hi-hi-lo-lo
425188	AK002052	Hs.155071	hypothetical protein FLJ11190	hi-hi-lo-lo
436315	BE390513	Hs.27935	hypothetical protein MGC4837	hi-hi-lo-lo
400297	AI127076	Hs.306201	hypothetical protein DKFZp564O1278	hi-hi-lo-lo
431089	BE041395		ESTs, Weakly similar to unknown protein	hi-hi-lo-lo
418824	AW751661	Hs.53542	choreoacanthocytosis gene; KIAA0986 prot	hi-hi-lo-lo
449226	AB002365	Hs.23311	KIAA0367 protein	hi-hi-lo-lo
450149	AW969781	Hs.132863	Zic family member 2 (odd-paired Drosophi	hi-hi-lo-lo
418443	NM_005239	Hs.85146	v-ets avian erythroblastosis virus E26 o	hi-hi-lo-lo
458692	BE549905	Hs.231754	ESTs	hi-hi-lo-lo
410102	AW248508	Hs.279727	ESTs; homologue of PEM-3 [Ciona savignyi	hi-hi-lo-lo
451062	AL110125	Hs.25910	Homo sapiens mRNA; cDNA DKFZp564C1416 (f	hi-hi-lo-lo
407633	NM_007069	Hs.37189	similar to rat HREV107	hi-hi-lo-lo
418941	AA452970	Hs.239527	E1B-55kDa-associated protein 5	hi-hi-lo-lo
407059	X95406		gb:H.sapiens cyclin E gene.	hi-hi-lo-lo
455956	BE162704		gb:PM1-HT0454-301299-001-d08 HT0454 Homo	hi-hi-lo-lo
437763	AA469369	Hs.5831	tissue inhibitor of metalloproteinase 1	hi-hi-lo-lo
451404	AA460775	Hs.6295	ESTs, Weakly similar to T17248 hypotheti	hi-hi-lo-lo
428494	AA233439	Hs.184634	hypothetical protein FLJ20005	hi-hi-lo-lo
414957	D61283	Hs.45206	ESTs	hi-hi-lo-lo
456415	AI734051	Hs.277102	ESTs, Weakly similar to ALU1_HUMAN ALU S	hi-hi-lo-lo
400183			Eos Control	hi-hi-lo-lo
400158			ENSP00000244302*:CDNA FLJ11591 fis, clon	hi-hi-lo-lo
403893			ENSP00000237068*:Protocadherin alpha 6 p	hi-hi-lo-lo
423809	AI223833	Hs.154483	ESTs	hi-hi-lo-lo
400170			Eos Control	hi-hi-lo-lo
403291			Target Exon	hi-hi-lo-lo
422026	U80736	Hs.110826	trinucleotide repeat containing 9	hi-hi-lo-lo
417130	AW276858	Hs.81256	S100 calcium-binding protein A4 (calcium	hi-hi-lo-lo
432472	AA548781	Hs.136418	ESTs	hi-hi-lo-lo
405231			C2001066:gi|10257425|ref|NP_033892.1| CD	hi-hi-lo-lo
400141			Eos Control	hi-hi-lo-lo
428971	BE278404	Hs.285813	hypothetical protein FLJ11807	hi-hi-lo-lo
422390	AW450893	Hs.121830	ESTs, Weakly similar to T42682 hypotheti	hi-hi-lo-lo
425538	BE270918	Hs.164028	Homo sapiens, clone IMAGE:3534875, mRNA,	hi-hi-lo-lo
456972	AI054347	Hs.2017	ribosomal protein L38	hi-hi-lo-lo
456622	AF205849	Hs.107740	Kruppel-like factor 2 (lung)	hi-hi-lo-lo
418515	AI588453	Hs.19487	ESTs, Weakly similar to CNIH_HUMAN CORNI	hi-hi-lo-lo
448439	BE613082	Hs.28229	ARG99 protein	hi-hi-lo-lo
445418	AW139377	Hs.127179	cryptic gene	hi-hi-lo-lo
402559	Z23024		Rho GTPase activating protein 1	hi-hi-lo-lo
402575	Z23024		Rho GTPase activating protein 1	hi-hi-lo-lo
420811	AA807544		ESTs, Weakly similar to B34323 GTP-bindi	hi-hi-lo-lo
446627	AI973016	Hs.15725	hypothetical protein SBBI48	hi-hi-lo-lo
400247			Eos Control	hi-hi-lo-lo
430289	AK001952	Hs.238039	hypothetical protein FLJ11090	hi-hi-lo-lo
400133			Eos Control	hi-hi-lo-lo
418816	T29621	Hs.88778	carbonyl reductase 1	hi-hi-lo-lo
433579	BE264473	Hs.284297	hypothetical protein from EUROIMAGE 1967	hi-hi-lo-lo
401952			Target Exon	hi-hi-lo-lo
410349	AW663021	Hs.323445	ESTs, Weakly similar to T2D3_HUMAN TRANS	hi-hi-lo-lo
417558	AF045229	Hs.82280	regulator of G-protein signalling 10	hi-hi-lo-lo
446851	AW007332	Hs.10450	Homo sapiens cDNA: FLJ22063 fis, clone H	hi-hi-lo-lo
404489			Target Exon	hi-hi-lo-lo
405802			Target Exon	hi-hi-lo-lo
456266	L29073	Hs.198726	cold shock domain protein A	hi-hi-lo-lo
457133	M54968		v-Ki-ras2 Kirsten rat sarcoma 2 viral on	hi-hi-lo-lo
459330	C16931		gb:C16931 Clontech human aorta polyA mRN	hi-hi-lo-lo
433041	BE265848	Hs.289080	colon cancer-associated protein Mic1	lo-lo-lo-hi
446545	AI431798	Hs.164192	ESTs, Weakly similar to Y161_HUMAN HYPOT	lo-lo-lo-hi
414911	NM_000107	Hs.77602	damage-specific DNA binding protein 2 (4	lo-lo-lo-hi
414682	AL021154	Hs.76884	inhibitor of DNA binding 3, dominant neg	lo-lo-lo-hi
422311	AF073515	Hs.114948	cytokine receptor-like factor 1	lo-lo-lo-hi
447329	BE090517		ESTs, Moderately similar to ALU8_HUMAN A	lo-lo-lo-hi
412942	AL120344	Hs.75074	mitogen-activated protein kinase-activat	lo-lo-lo-hi
420747	BE294407	Hs.99910	phosphofructokinase, platelet	lo-lo-lo-hi
431912	AI660552	Hs.76549	ESTs, Weakly similar to A56154 Abl subst	lo-lo-lo-hi
446506	AI123118	Hs.15159	chemokine-like factor, alternatively spl	lo-lo-lo-hi
408633	AW963372	Hs.46677	PRO2000 protein	lo-lo-lo-hi
433675	AW977653	Hs.75319	ribonucleotide reductase M2 polypeptide	hi-lo-lo-hi
424560	AA158727	Hs.150555	protein predicted by clone 23733	hi-lo-lo-hi
425234	AW152225	Hs.165909	ESTs, Weakly similar to I38022 hypotheti	hi-lo-lo-hi
439815	AA206079	Hs.6693	hypothetical protein FLJ20420	hi-lo-lo-hi
410174	AA306007	Hs.59461	DKFZP434C245 protein	hi-lo-lo-hi
410442	X73424	Hs.63788	propionyl Coenzyme A carboxylase, beta p	hi-lo-lo-hi
429190	H18650	Hs.92602	ESTs	hi-lo-lo-hi
423619	T48691	Hs.249159	adrenergic, alpha-2A-, receptor	hi-lo-lo-hi

433764	AW753676	Hs.39982	ESTs	hi-lo-lo-hi
421998	R74441	Hs.117176	poly(A)-binding protein, nuclear 1	hi-lo-lo-hi
451593	AF151879	Hs.26706	CGI-121 protein	hi-lo-lo-hi
452092	BE245374	Hs.27842	hypothetical protein FLJ11210	hi-lo-lo-hi
447425	AI963747	Hs.18573	acylphosphatase 1, erythrocyte (common)	hi-lo-lo-hi
421654	AW163267	Hs.106469	suppressor of var1 (S.cerevisiae) 3-like	hi-lo-lo-hi
432502	NM_014641	Hs.277585	KIAA0170 gene product	hi-lo-lo-hi
429597	NM_003816	Hs.2442	a disintegrin and metalloproteinase doma	hi-lo-lo-hi
434203	BE262677	Hs.283558	hypothetical protein PRO1855	hi-lo-lo-hi
438461	AW075485	Hs.286049	phosphoserine aminotransferase	hi-lo-lo-hi
409142	AL136877	Hs.50758	SMC4 (structural maintenance of chromoso	hi-lo-lo-hi
439574	AI469788	Hs.165190	ESTs	hi-lo-lo-hi
438182	AW342140	Hs.182545	ESTs, Weakly similar to ALU1_HUMAN ALU S	hi-lo-lo-hi
449103	T24968	Hs.23038	HSPC071 protein	hi-lo-lo-hi
421059	AI654133	Hs.30212	thyroid receptor interacting protein 15	hi-lo-lo-hi
446939	AL133353	Hs.16606	CGI-32 protein	hi-lo-lo-hi
408576	NM_003542	Hs.46423	H4 histone family, member G	hi-lo-lo-hi
410073	AW408163	Hs.58488	catenin (cadherin-associated protein), a	hi-lo-lo-hi
450912	AW939251	Hs.25647	v-fos FBJ murine osteosarcoma viral onco	hi-lo-lo-hi
434701	AA460479	Hs.321707	KIAA0742 protein	hi-lo-lo-hi
450455	AL117424	Hs.25035	chloride intracellular channel 4	hi-lo-lo-hi
451144	AW956103	Hs.61712	pyruvate dehydrogenese kinase, isoenzyme	hi-lo-lo-hi
427390	AI432163	Hs.268231	Homo sapiens cDNA: FLJ23111 fis, clone L	hi-lo-lo-hi
451831	NM_001674	Hs.460	activating transcription factor 3	hi-lo-lo-hi
406776	T16206	Hs.237164	ESTs, Highly similar to LDHH_HUMAN L-LAC	hi-lo-lo-hi
428157	AI738719	Hs.198427	hexokinase 2	hi-lo-lo-hi
408096	BE250162	Hs.83765	dihydrofolate reductase	hi-lo-lo-hi
418203	X54942	Hs.83758	CDC28 protein kinase 2	hi-lo-lo-hi
449338	H73444	Hs.394	adrenomedullin	hi-lo-lo-hi
422082	AA016188	Hs.111244	hypothetical protein	hi-lo-lo-hi
407907	AI752235	Hs.41270	procollagen-lysine, 2-oxoglutarate 5-dio	hi-lo-lo-hi
416655	AW968613	Hs.79428	BCL2/adenovirus E1B 19kD-interacting pro	hi-lo-lo-hi
419551	AW582256	Hs.91011	anterior gradient 2 (Xenepus laevis) hom	hi-lo-lo-hi
434094	AA305599	Hs.238205	hypothetical protein PRO2013	hi-lo-lo-hi
443951	F13272	Hs.111334	ferritin, light polypeptide	hi-lo-lo-hi
422975	AA347720	Hs.122669	KIAA0264 protein	hi-lo-lo-hi
430314	AA369601	Hs.239138	pre-B-cell colony-enhancing factor	hi-lo-lo-hi
412664	AA421404	Hs.346868	nucleolar protein p40; homolog of yeasl	hi-lo-lo-hi
408089	H59799	Hs.42644	thioredoxin-like	hi-lo-lo-hi
409690	W45393	Hs.55888	activating transcnption factor 7	hi-lo-lo-hi
442332	AI693251	Hs.8248	Target CAT	hi-lo-lo-hi
408388	AF091086	Hs.44563	hypothetical protein	hi-lo-lo-hi
441252	AW360901	Hs.183047	hypothetical protein MGC4399	hi-lo-lo-hi
433069	X78732	Hs.3164	nucleobindin 2	hi-lo-lo-hi
443837	AI984625	Hs.9884	spindle pole body protein	hi-lo-lo-hi
426108	AA622037	Hs.166468	programmed cell death 5	hi-lo-lo-hi
441181	AA418925	Hs.121076	peptidylprolyl isomerase (cyclophilin)-l	hi-lo-lo-hi
447397	BE247676	Hs.18442	E-1 enzyme	hi-lo-lo-hi
427505	AA361562	Hs.178761	26S proteasome-associated pad1 homolog	hi-lo-lo-hi
430287	AW182459	Hs.125759	ESTs, Weakly similar to LEU5_HUMAN LEUKE	hi-lo-lo-hi
415857	AA866115	Hs.127797	Homo sapiens cDNA FLJ11381 fis, clone HE	hi-lo-lo-hi
423198	M81933	Hs.1634	cell division cycle 25A	hi-lo-lo-hi
407687	AK002011	Hs.37558	hypothetical protein FLJ11149	hi-lo-lo-hi
431374	BE258532	Hs.251871	CTP synthase	hi-lo-lo-hi
413273	U75679	Hs.75257	stem-loop (histone) binding protein	hi-lo-lo-hi
442799	AI564739	Hs.88505	ESTs	hi-lo-lo-hi
443881	R64512	Hs.237146	hypothetical protein FLJ12752	hi-lo-lo-hi
416209	AA236776	Hs.79078	MAD2 (mitotic arrest deficient, yeast, h	hi-lo-lo-hi
421834	BE543205	Hs.288771	DKFZP586A0522 protein	hi-lo-lo-hi
411263	BE297802	Hs.69360	kinesin-like 6 (mitotic centromere-assoc	hi-lo-lo-hi
413924	AL119964	Hs.75616	seladin-1	hi-lo-lo-hi
450598	AF151078	Hs.25199	hypothetical protein	hi-lo-lo-hi
439453	BE264974	Hs.6566	thyroid hormone receptor interactor 13	hi-lo-lo-hi
429612	AF062649	Hs.252587	pituitary tumor-transforming 1	hi-lo-lo-hi
443426	AF098158	Hs.9329	chromosome 20 open reading frame 1	hi-lo-lo-hi
452353	C18825	Hs.29191	epithelial membrane protein 2	hi-lo-lo-hi
419879	Z17805	Hs.93564	Homer, neuronal immediate early gene, 2	hi-lo-lo-hi
422363	T55979	Hs.115474	replication factor C (activator 1) 3 (38	hi-lo-lo-hi
416065	BE267931	Hs.78996	proliferating cell nuclear antigen	hi-lo-lo-hi
424308	AW975531	Hs.154443	minichromosome maintenance deficient (S.	hi-lo-lo-hi
447519	U46258	Hs.339665	ESTs	hi-lo-lo-hi
437679	NM_014214	Hs.5753	inositol(myo)-1(or 4)-monophosphatase 2	hi-lo-lo-hi
446636	AC002563	Hs.15767	citron (rho-interacting, serine/threonin	hi-lo-lo-hi
422094	AF129535	Hs.272027	F-box only protein 5	hi-lo-lo-hi
440334	BE276112	Hs.7165	zinc finger protein 259	hi-lo-lo-hi
421921	H83363	Hs.6820	translocase of inner mitochondrial membr	hi-lo-lo-hi
422938	NM_001809	Hs.1594	centromere protein A (17kD)	hi-lo-lo-hi
427719	AI393122	Hs.134726	ESTs	hi-lo-lo-hi
422283	AW411307	Hs.114311	CDC45 (cell division cycle 45, S.cerevis	hi-lo-lo-hi
424840	D79987	Hs.153479	extra spindle poles, S. cerevisiae, homo	hi-lo-lo-hi
418216	AA662240	Hs.283099	AF15q14 protein	hi-lo-lo-hi
412140	AA219691	Hs.73625	RAB6 interacting, kinesin-like (rabkines	hi-lo-lo-hi

418322	AA284166	Hs.84113	cyclin-dependent kinase inhibitor 3 (CDK	hi-lo-lo-hi
428479	Y00272	Hs.334562	cell division cycle 2, G1 to S and G2 to	hi-lo-lo-hi
449722	BE280074	Hs.23960	cyclin B1	hi-lo-lo-hi
417933	X02308	Hs.82962	thymidylate synthetase	hi-lo-lo-hi
433001	AF217513	Hs.279905	clone HQ0310 PRO0310p1	hi-lo-lo-hi
413943	AW294416	Hs.144687	Homo sapiens cDNA FLJ12981 fis, clone NT	hi-lo-lo-hi
424905	NM_002497	Hs.153704	NIMA (never in mitosis gene a)-related k	hi-lo-lo-hi
422765	AW409701	Hs.1578	baculoviral IAP repeat-containing 5 (sur	hi-lo-lo-hi
425397	J04088	Hs.156346	topoisomerase (DNA) II alpha (170kD)	hi-lo-lo-hi
444371	BE540274	Hs.239	forkhead box M1	hi-lo-lo-hi
422956	BE545072	Hs.122579	ECT2 protein (Epithelial cell transformi	hi-lo-lo-hi
444783	AK001468	Hs.62180	anillin (Drosophila Scraps homolog), act	hi-lo-lo-hi
453884	AA355925	Hs.36232	KIAA0186 gene product	hi-lo-lo-hi
416980	AA381133	Hs.80684	high-mobility group (nonhistone chromoso	hi-lo-lo-hi
442432	BE093589	Hs.38178	hypothetical protein FLJ23468	hi-lo-lo-hi
417308	H60720	Hs.81892	KIAA0101 gene product	hi-lo-lo-hi
433133	AB027249	Hs.104741	PDZ-binding kinase; T-cell originated pr	hi-lo-lo-hi
432626	AA471098	Hs.278544	acetyl-Coenzyme A acetyltransferase 2 (a	hi-lo-lo-hi
441020	W79283	Hs.35962	ESTs	hi-lo-lo-hi
412281	AI810054	Hs.14119	ESTs	hi-lo-lo-hi
435602	AF217515	Hs.283532	uncharacterized bone marrow protein BM03	hi-lo-lo-hi
400882			Target Exon	hi-lo-lo-hi
446269	AW263155	Hs.14559	hypothetical protein FLJ10540	hi-lo-lo-hi
417847	AI521558	Hs.7331	hypothetical protein FLJ22316	hi-lo-lo-hi
400881			NM_025080:Homo sapiens hypothetical prot	hi-lo-lo-hi
419356	AI656166	Hs.7331	hypothetical protein FLJ22316	hi-lo-lo-hi
400292	AA250737	Hs.72472	BMP-R1B	hi-lo-lo-hi
415539	AI733881	Hs.72472	BMP-R1B	hi-lo-lo-hi
453935	AI633770	Hs.42572	ESTs	hi-lo-lo-hi
420005	AW271106	Hs.133294	ESTs	hi-lo-lo-hi
428450	NM_014791	Hs.184339	KIAA0175 gene product	hi-lo-lo-hi
436291	BE568452	Hs.344037	protein regulator of cytokinesis 1	hi-lo-lo-hi
441362	BE614410	Hs.23044	RAD51 (S. cerevisiae) homolog (E coli Re	hi-lo-lo-hi
428484	AF104032	Hs.184601	solute carrier family 7 (cationic amino .	hi-lo-lo-hi
418526	BE019020	Hs.85838	solute carrier family 16 (monocarboxylic	hi-lo-lo-hi
458809	AW972512	Hs.20985	sin3-associated polypeptide, 30kD	hi-lo-lo-hi
444984	H15474	Hs.132898	fatty acid desaturase 1	hi-lo-lo-hi
447342	AI199268	Hs.19322	Homo sapiens, Similar to RIKEN cDNA 2010	hi-hi-lo-lo
428330	L22524	Hs.2258	matrix metalloproteinase 7 (matrilysin,	hi-hi-lo-lo
428336	AA503115	Hs.183752	microseminoprotein, beta-	hi-hi-lo-lo
430389	AL117429	Hs.240845	DKFZP434D146 protein	hi-hi-lo-lo
417318	AW953937	Hs.240845	ESTs	hi-hi-lo-lo
422545	X02761	Hs.287820	fibronectin 1	hi-hi-lo-lo
417640	D30857	Hs.82353	protein C receptor, endothelial (EPCR)	hi-lo-lo-lo
422809	AK001379	Hs.121028	hypothetical protein FLJ10549	hi-lo-lo-hi
425580	L11144	Hs.1907	galanin	hi-lo-lo-hi
416836	D54745	Hs.80247	cholecystokinin	hi-lo-lo-hi
434170	AA828509	Hs.122329	ESTs	hi-lo-lo-hi
427958	AA418000	Hs.98280	potassium intermediate/small conductance	hi-lo-lo-hi
439706	AW872527	Hs.59761	ESTs, Weakly similar to DAP1_HUMAN DEATH	hi-lo-lo-hi
450088	AW292933	Hs.254110	ESTs	hi-lo-lo-hi
414219	W20010	Hs.75823	ALL1-fused gene from chromosome 1q	hi-lo-lo-hi
419201	M22324	Hs.1239	alanyl (membrane) aminopeptidase (aminop	hi-lo-lo-hi
426283	AI908774	Hs.259785	carnitine palmitoyltransferase I, liver	hi-lo-lo-hi
456236	AF045229	Hs.82280	regulator of G-protein signalling 10	hi-lo-lo-hi
456607	AI660190	Hs.106070	cyclin-dependent kinase inhibitor 1C (p5	hi-lo-lo-hi
408437	AW957744	Hs.278469	lacrimal proline rich protein	hi-lo-lo-hi
421180	BE410992	Hs.258730	heme-regulated initiation factor 2-alpha	hi-lo-lo-hi
413437	BE313164	Hs.75361	gene from NF2/meningioma region of 22q12	hi-lo-lo-hi
432415	T16971	Hs.289014	ESTs, Weakly similar to A43932 mucin 2 p	hi-lo-lo-hi
449230	BE613348	Hs.211579	melanoma cell adhesion molecule	hi-lo-lo-hi
417979	AU077284	Hs.83081	GTP cyclohydrolase I feedback regulatory	hi-lo-lo-hi
421877	AW250380	Hs.109059	mitochondrial ribosomal protein L12	hi-lo-lo-hi
412482	AI499930	Hs.334885	mitochondrial GTP binding protein	hi-lo-lo-hi
428423	AU076517	Hs.184276	solute carrier family 9 (sodium/hydrogen	hi-lo-lo-hi
422947	AA306782	Hs.122552	G-2 and S-phase expressed 1	hi-lo-lo-hi
441072	AW275480	Hs.39504	hypothetical protein MGC4308	hi-lo-lo-hi
415938	BE383507	Hs.78921	A kinase (PRKA) anchor protein 1	hi-lo-lo-hi
432278	AL137506	Hs.274256	hypothetical protein FLJ23563	hi-lo-lo-hi
446651	AA393907	Hs.97179	ESTs	hi-lo-lo-hi
431515	NM_012152	Hs.258583	endothelial differentiation, lysophospha	hi-lo-lo-hi
445345	AW003850	Hs.12532	chromosome 1 open reading frame 21	hi-lo-lo-hi
458965	AA010319	Hs.60389	ESTs	hi-lo-lo-hi
438321	AA576635	Hs.6153	CGI-48 protein	hi-lo-lo-hi
416783	AA206186	Hs.79889	monocyte to macrophage differentiation-a	hi-lo-lo-hi
453563	AW608906	Hs.181163	hypothetical protein MGC5629	hi-lo-lo-hi
432393	AW205863	Hs.133988	hypothetical protein FKSG2B	hi-lo-lo-hi
433914	AF108138	Hs.112160	Homo sapiens DNA helicase homolog (PIF1)	hi-lo-lo-hi
414907	X90725	Hs.77597	polo (Drosophia)-like kinase	hi-lo-lo-hi
432375	BE536069	Hs.2962	S100 calcium-binding protein P	hi-lo-lo-hi
440773	AA352702	Hs.37747	Homo sapiens, Similar to RIKEN cDNA 2700	hi-lo-lo-hi
415994	NM_002923	Hs.78944	regulator of G-protein signalling 2, 24k	hi-lo-lo-hi

412722	AI343300	Hs.15091	ESTs	hi-lo-lo-hi
446839	BE091926	Hs.16244	mitotic spindle coiled-coil related prot	hi-lo-lo-hi
428862	NM_000346	Hs.2316	SRY (sex determining region Y)-box 9 (ca	hi-lo-lo-hi
439108	AW163034	Hs.6467	synaptogyrin 3	hi-lo-lo-hi
430178	AW449612	Hs.152475	ESTs	hi-lo-lo-hi
421733	AL119671	Hs.1420	fibroblast growth factor receptor 3 (ach	hi-lo-lo-hi
452410	AL133619		Homo sapiens mRNA; cDNA DKFZp434E2321 (f	hi-lo-lo-hi
430132	AA204686	Hs.234149	hypothetical protein FLJ20647	hi-lo-lo-hi
428297	AA236291	Hs.183583	serine (or cysteine) proteinase inhibito	hi-lo-lo-hi
413142	M81740	Hs.75212	ornithine decarboxylase 1	hi-lo-lo-hi
427239	BE270447	Hs.174070	ubiquitin carrier protein	hi-lo-lo-hi
409738	BE222975	Hs.56205	insulin induced gene 1	hi-lo-lo-hi
410748	BE383816	Hs.12532	chromosome 1 open reading frame 21	hi-lo-lo-hi
424506	AF220490	Hs.149623	group III secreted phospholipase A2	hi-lo-lo-hi
447333	BE090580	Hs.70704	hypothetical protein dJ616B8.3	hi-lo-lo-hi
414761	AU077228	Hs.77256	enhancer of zeste (Drosophila) homolog 2	hi-lo-lo-hi
419602	AW248434	Hs.91521	hypothetical protein	hi-lo-lo-hi
411669	BE612676	Hs.303116	stromal cell-derived factor 2-like 1	hi-lo-lo-hi
452322	BE566343	Hs.28988	glutaredoxin (thioltransferase)	hi-lo-lo-hi
426006	R49031	Hs.22627	ESTs	hi-lo-lo-hi
457465	AW301344	Hs.122908	DNA replication factor	hi-lo-lo-hi
406867	AA157857	Hs.182265	keratin 19	hi-lo-lo-hi
407230	AA157857	Hs.182265	keratin 19	hi-lo-lo-hi
446681	AJ003624	Hs.15896	kendrin	hi-lo-lo-hi
408493	BE206854	Hs.46039	phosphoglycerate mutase 2 (muscle)	hi-lo-lo-hi
439186	AI697274	Hs.105435	GDP-mannose 4,6-dehydratase	hi-lo-lo-hi
424544	M88700	Hs.150403	dopa decarboxylase (aromatic L-amino aci	hi-lo-lo-hi
431325	AW026751	Hs.5794	ESTs, Weakly similar to 2109260A B cell	hi-lo-lo-hi
414922	D00723	Hs.77631	glycine cleavage system protein H (amino	hi-lo-lo-hi
438291	BE514605	Hs.289092	Homo sapiens cDNA: FLJ22380 fis, clone H	hi-lo-lo-hi
418574	N28754		M-phase phosphoprotein 9	hi-lo-lo-hi
409342	AU077058	Hs.54089	BRCA1 associated RING domain 1	hi-lo-lo-hi
432734	AA837396	Hs.263925	LIS1-interacting protein NUDE1, rat homo	hi-lo-lo-hi
438087	BE300296	Hs.5054	CGI-133 protein	hi-lo-lo-hi
420309	AW043637	Hs.21766	ESTs, Weakly similar to ALU5_HUMAN ALU S	hi-lo-lo-hi
411619	AI418609	Hs.71040	hypothetical protein FLJ20425	hi-lo-lo-hi
424381	AA285249	Hs.146329	protein kinase Chk2	hi-lo-lo-hi
442547	AA306997	Hs.217484	ESTs, Weakly similar to ALU1_HUMAN ALU S	hi-lo-lo-hi
430376	AW292053	Hs.12532	chromosome 1 open reading frame 21	hi-lo-lo-hi
434866	AF151103	Hs.112259	T cell receptor gamma locus	hi-lo-lo-hi
412330	NM_005100	Hs.788	A kinase (PRKA) anchor protein (gravin)	hi-lo-lo-hi
452123	AI267615	Hs.38022	ESTs	hi-lo-lo-hi
424893	AW295112	Hs.153648	Homo sapiens cDNA FLJ13303 fis, clone OV	hi-lo-lo-hi
428057	AI343641	Hs.185798	ESTs	hi-lo-lo-hi
431566	AF176012	Hs.260720	J domain containing protein 1	hi-lo-lo-hi
439979	AW600291	Hs.6823	hypothetical protein FLJ10430	hi-lo-lo-hi
418836	AI655499	Hs.161712	ESTs	hi-lo-lo-hi
433757	AI949974	Hs.152870	ESTs	hi-lo-lo-hi
425236	AW067800	Hs.155223	stanniocalcin 2	hi-lo-lo-hi
426215	AW963419	Hs.155223	stanniocalcin 2	hi-lo-lo-hi

TABLE 2B

Pkey: Unique Eos probeset identifier number
CAT number: Gene cluster number
Accession: Genbank accession numbers

Pkey	CAT Number	Accession
408660	107294_1	AA525775 AA056342 AI538978 AW975281 AA664986
409051	109699_1	AA080912 AA075318 AA083403 AA076594 AA078992 AA084926 AA081881 AA113913 AA113892 AA083821 AA134801 AA082953 AA070343 AA062835 AA075419 AA063293 AA071252 AA078900 AA062836 AW974305
409123	110143_1	AA063403 AA070823 AA070050
410216	1184664_1	BE061839 AW859863 AW606085
410451	1204118_1	BE065687 BE065637 AW749002 H73690
410498	120611_1	AA355749 AA085520 AW966333 AA340319 BE170936
411053	1230446_1	AW815061 H71965 AW815072 AW815048 AW815041 AW815047 BE152831 BE152490 BE149043 BE149075 BE149035 BE149067
411233	1236369_1	AW833793 AW833799 AW833346 AW833371 AW833795 AW833562 AW833667 AW833377
411283	1237666_1	AW852754 AW852897 AW852757 AW852617 BE172755 AW835444
411701	1254466_1	BE181659 AW890576 AW857638
411831	1260400_1	AW994394 AW865900 AW865905 AW865891 AW866014 AW865898
412419	1293418_1	AW948630 AW948626 AW948634 AW948616 AW948627 AW948615 AW948631 AW948605 AW948611 AW948610 AW948633 AW948623 AW948628 AW948604 AW948602 AW948607
412492	130082_1	AW962604 AA368639 AA112257
412657	1318507_1	AW976165 C04000
413351	1363660_1	BE086815 BE086823 R81218 R69229
413509	1374313_1	BE145419 BE145433
413672	1382512_1	BE156536 BE156439 BE156700 BE156449 BE156653 BE156533 BE156524 BE156670 BE156721 BE156723
415308	1533673_1	F05251 R13748 Z44028 H14747
415516	1539185_1	F11411 R15237 Z43915 H20760
416508	1597894_1	R39769 T53143 H60012
416631	1605019_1	H69466 H93884 N59684
416954	163427_1	AI222358 N73390 D61648 AA243520 AA190953
417314	1666649_1	N68168 N69188 N90450
418056	171841_1	AA524886 AW971347 AA211537
418259	173388_1	AA215404 AI990909 BE464132 AW271459 N74332 AI262061
418574	17690_1	N28754 N28747 AI568146 AI979339 AA322671 AA322672 AW955043 AI990326 AA776406 AI016250 AA843678 AW451882 N23137 N23129 W70051 AI038748 AA831327 AI925845 AW945895
419555	185884_1	AA244416 AA244401
420811	196677_1	AA807544 AA280648 AI243056 AI022744 AA705288 AA829425 AW452095 AI929317 R19039 AA282024
421911	208987_1	AL041520 AA300086
421974	209807_1	AA301270 AA301379 AA301366
422128	211994_1	AW881145 AA490718 M85637 AA304575 T06067 AA331991
423028	224062_1	H90946 AA320597 AW954970 BE143680
423476	22861_1	AL035633 F11794 F11783 H18042 T66089 H29379 R19493 AW134660 AI299437 AL133995 AA057405 N78357 AA917450 AI002692 T09262 T65008 H29290 AI200874 AA894415 AI732887 AI791768 AI733447 AA988785 N62128 T09261 AW956936
423895	233006_1	AA332215 AA403110 AW965299
424593	241234_1	AA343729 AA345779 AA344370
425074	246486_1	AA495930 AI470890 H97831 AA350358 BE166712
425291	249618_1	AA354572 AW062361 AW813419 AW816041 AI744949
425980	258778_1	AA366951 AA470999 AA469425
426413	266650_1	AA377823 AW954494 AI022688
428181	287953_1	AA423976 AA437075 BE006469
429163	300543_1	AA884766 AW974271 AA592975 AA447312
429540	305828_1	M85776 AA454535 AA456208 H90189
430068	312849_1	AA464964 M85405 AA947566
430103	313089_1	AA465259 AW897142 AW897144
430439	31808_1	AL133561 AL041090 AL117481 AL122069 AW439292 AI968826
431089	327825_1	BE041395 AA491826 AA621946 AA715980 AA666102
431843	338324_1	AA516420 C14818 C14815 C15161 C15068 D80763 D60656 AW970134 AA543007 D81004 D60184 AI498371 D60382 D60181 C15876
432079	341114_1	AW972746 AA525323 AI150314
432340	345248_1	AA534222 AA632632 T81234
432676	352582_2	AI187366 AA558869 AA618478
433075	35820_1	NM_002959 X98248 AA233278 AA846376 AI470560 AI470533 BE327147 AW291971 AA017125 AI198417 AI365213 AI168442 AI337018 AI475049 H85459 AA969895 AA888000 AA418326 AA418378 N71981 AL043634 AA426361 AA418275 AA232975 AL036861 BE277220 BE387505 N99710 AW375004 AA418268 AL079651 H85743 AW902319 AW805907 AA984366 T92310 AA405425 AA421732 AI656841 AW300968 AW593418 T92267 BE464032 AW473548 AI359502 BE552306 AI990196 AW518351 AI239559 AW590963 AA018359 AI273737 AL042658 AA411308 AA402810 H38111 AW013931 AW366432 AW752435 AW376124 AI292020 AI292121 AA340647 BE613672 BE409874 AA351915 BE617026 BE019588 AW402692 AW247466 R59233 AA134761 BE254019 BE265105 D63316 BE313080 BE547713 8E536578 BE546749 AA324185 H17386 BE253377 R87598 H29072 AA350980 BE076629 BE253957 AA532613 BE252486 AW804459 D30966 R87959 AA091832
434280	382816_1	BE005398 AA628622 AA994155
434609	38950_1	R76593 AF147390 R76594
435023	398093_1	AI692552 AI393343 AI800510 AI377711 F24263 AA661876
436716	425440_1	AI433540 AA728984 AA804981
436862	42814_2	AI821940 N67106 AI744264 AA808846 AA643417 AA643416 Z70715
437576	43892_1	BE514383 AA071273 AW247987 AW673286 BE312102 AW749824 BE071985 AW577383 BE071945 BE072005 AW577355 BE071965 AW239231 BE072000 BE071960 AW577360 AW749830 AW373020 X97303 AW999522 BE000192 BE562219 BE266655 BE264970
438869	46651_1	AF075009 R63109 R63068
438882	466649_1	AA827695 AA833754 AW978946
438980	467544_1	AW502384 AI982587 AA828822
439046	468133_1	AA947354 AA829660 AI687296
439848	477806_1	AW979249 D63277 AA846968
440151	487109_1	AA868167 F21558 F31418 F35624
440507	495677_1	H06994 BE147898

441102	509604_1	AA973905 AI299888 AA917019 H63235 T90771
442048	531432_1	AA974603 AI984319 AW340495
443161	561305_1	AI038316 AI344631 AI261653
444290	59994_1	AA262498 AV648929 AA305356 D61644 D78724
444314	600667_1	AI140497 AW749625 AW749626 AW749644
445808	65133_1	AV655234 AW966332 AA340239
447329	71759_1	BE090517 AW970792 AW264490 AW014985 F27436 AA947336 F15843 H89338 AA563626 F17712 BE546579 AA421821 AA284852 AA477751 AW025245
447448	722246_1	BE244285 C18429 H42373 AI820706 AI379786 R55439 AW276142
448150	752165_1	AI472167 AI990315 R32175
448489	765247_1	AI523875 R45782 R45781
448631	772996_1	AI554923 AI902356
448738	77790_1	BE614081 W01988 AW500790
452410	9163_1	AL133619 AA468118 AA383064 AI476447 T09430 AI673758 AA524895 AI581345 AI300820 AW498812 AA256162 AI559724 AI685732 AA602400 AA905453 AI204595 AW166541 AA157456 AA156269 AA383652 AA431072 AW592707 AI435410 AW272464 AI215594 AA622747 R74039 N35031 AI804128 AW513621 AA868351 AI026826 AI493388 AA614641 W81604 AI567080 AI214351 AA730140 AI125754 AI200813 AI269603 AI565082 AI807095 AI476629 AA505909 AI368449 AI686077 AI582930 AW085038 AA757863 AA730154 AI767072 AA468316 AI734130 AI734138 AA426284 AA433997 AI741241 AW043563 AI732741 AI732734 AA437369 AA425820 AA664048 R74130
452444	918078_1	BE144022 BE143969 BE143915
452654	925931_1	BE004783 BE004947 AI911790
454775	1234106_1	BE160229 AW819879 AW820179 AW819882 AW819876 AW820169 BE153201 AW993736 BE152911
455019	1249138_1	AW850818 AW850833 AW851100
455272	1271871_1	BE148152 BE148133 BE148159 BE148132 AW885107
455619	1346387_1	BE063853 BE063955 BE063866 BE063705 BE063846 BE061416 BE063844
455653	1348742_1	BE154075 BE153973 BE064861 BE153852 BE153847 BE064684 BE153602 BE065075 BE154018 BE064772 BE064842 BE153557 BE153509
455729	1353792_1	BE072092 BE072106 BE072086 BE072098 BE072103
455824	1372880_1	BE143703 BE143631 BE143629 BE143702
455956	1387163_1	BE162704 BE162705 BE162732 BE162702 BE162694
456123	1534442_1	R00602 Z42921 F06132
457133	29066_1	M54968 NM_004985 AI808924 AL135130 AW242010 AA476848 AI740449 M17087 K03210 M35505 M35504 L00049 AI186585 W35273 X01669 X02825 W23635 AI554920 AI539465 AA425263 AI469981 W21091 T28976 AW977922 BE550180 AW664973 AI148939 AW117295 AA811229 AI343010 AA766141 BE219368 N95249 AA280396 AW504574 AA232870 AI770018 AA262948 AW450230 AW362890 AW609417 AW499941 AA425857 AW380665 AA830647 AA282180 T27356 H85307 AA861543 AA356548 AA356410 AW860656 AW860647 AW938103 AW860649 AI567016 N70374 AW474707 AA505084 AA082195 AW949515 AA361728 N33863 AA411821 AA401640 AW594461 AL120766 AI500024 AW771891 H84567 D51551 AA330460 R14184 AI301629 N64676 AV659669 AI697660 AI004579 AA287927 AW453052 AW601642 AA676681 AA737010 AA872481 AA281094 AA564243 BE464958 BE049265 AW167917 AA843916 AA525301 AI015987 N25230 AI889481 AW173466 AA937541 AI334416 AI676214 AI281159 AA553559 AA582189 AA255527 AW160515 AA670007 H08199 AA808271 AA281015 W47527 AA649252 AI364302 AA889246 R40473 H02312 AA648116 AA342730 AA243624 R99351 R41588 R49696 AA854442 F01713 AA213685 AA721296 R79833 H84241 R70668 H85554 AA223758 N95349 AI374913 AI306683 AA015609 AA918548 AI453570 AA772321 AI692775 AA195733 AI474563 AW873048 AI209133 AI028182 AI374920 AW572807 AA406223 AA833684 T97255 H69138 AA382906 AW119162 N31974 AI890584 N39418 AA864877 AA679469 BE350651 N41020 AI050915 F00075 AA864878 N26970 AA828898 AW019991 AW796631 AW993262 N48532 BE564662 AV654063 AI754461 AW945712 C03289 AV655314 AV659070 AV659808 AV660435 H70113 C05323 R91984 H96949 AV658936 AV658879 H69137 AA384411 AA412584 C02749 W32014 R58168 C05526 BE536017 N24354 AA287991 N80109 F05452 R12740 H08297 AL138354 AW020801 BE178443 BE178018 BE178336 BE178360 BE178107 BE178385 BE178215 BE178186 BE178447 BE178352 BE178422 BE178424 BE178043 BE178093 BE178460 BE178356 BE178441 BE178438 BE178467 AI091259 BE177839 BE178094 R28455 BE177844 BE178100 AA262387 R70669 W80934 W93668 AA256711 BE178141 BE177893 BE178449 AA167718 H69694 BE178017 BE178029 BE177999 BE177936 AA095144 N32462 AA281203 AA281183 W47526 W05015 R34165 R35396 T97366 R79640 W25258 R99450 AW368425 BE178196 R26447 C03146 C03683
457952	44256_1	U25750 AI792472 AA487379 AI872282 AA487262 R22383 AI865750 R21832 AA593628 AW571889 AA377191 R78814 T27193
458956	83645_1	BE220675 AA345621 AA009992

TABLE 2C

Pkey: Unique number corresponding to an Eos probeset
Ref: Sequence source. The 7 digit numbers in this column are Genbank Identifier (GI) numbers. "Dunham I. et al." refers to the publication entitled "The DNA sequence of human chromosome 22." Dunham I. et al. (1999) Nature 402:489-495.
Strand: Indicates DNA strand from which exons were predicted.
Nt_position: Indicates nucleotide positions of predicted exons.

Pkey	Ref	Strand	Nt_position
400481	8439853	Plus	112433-112541
400501	9796227	Minus	12479-12619
400713	8118874	Minus	43185-43394
400769	8131628	Plus	28671-29795
400818	8569994	Plus	172644-172765,173085-173200
400881	2842777	Minus	91446-91603,92123-92265
400882	2842777	Minus	110431-110708
400965	7770576	Minus	173043-173564
400986	8085497	Minus	63140-63319
400995	8099094	Plus	141186-141601
401093	8516137	Minus	22335-23166
401178	9438616	Minus	133663-133812
401192	9719502	Minus	69559-70101
401209	7712287	Plus	164932-165112
401405	7766126	Minus	69276-69452,69548-69958
401416	7452889	Minus	121456-121626
401419	7452669	Minus	136369-136506
401444	8346725	Plus	90695-90994,93070-93213
401512	7622346	Plus	136399-136557
401563	6247910	Plus	91395-91763
401600	4386746	Minus	27363-27516,28727-26691,29526-29731
401750	9828651	Plus	82143-82270,89284-89373,90596-90770,95822-96001,96688-96775,96870-96992,96046-96136
401757	7239630	Plus	66641-86751
401639	7656637	Plus	1016-1066,2751-2967,3241-3346,26677-26631
401849	7770425	Plus	129375-129483,129597-129720
401952	3319121	Minus	53770-53979
401966	3126761	Plus	29397-29916
402082	8117478	Minus	190046-190183
402101	6117697	Plus	134306-134467,135402-135567,136421-136546
402106	6131652	Plus	3717-3846
402163	8568936	Plus	166996-167119
402165	6576002	Plus	25466-25639
402240	7690131	Plus	104362-104527,106136-106372
402249	7704953	Minus	107636-107813,108694-106624,110435-110502,113182-113386
402347	6099267	Minus	13714-15440
402396	1905696	Plus	4426-4646
402469	9797107	Minus	71266-72351
402532	9600951	Minus	160240-160556
402559	9664273	Plus	33539-33715
402575	9884830	Minus	109742-109883
402602	7239666	Plus	6785-6972,7478-7575
402756	9213669	Plus	67636-87924
402766	9715046	Plus	47624-47795
402807	6456146	Minus	101542-101660,103476-103656
402610	6010110	Plus	12715-12856,13527-13643
402964	9561599	Minus	46624-46784
403046	3540153	Minus	55707-55859,56369-56511
403055	6746904	Minus	109532-110225
403217	7630969	Plus	54089-54163,55427-55623
403216	7630969	Plus	58039-58149
403291	7230870	Plus	95177-95435
403328	8469066	Minus	120428-120703
403654	6736093	Minus	28634-28756
403704	4982546	Minus	6850-8996
403708	5705981	Minus	134394-134612
403725	7534031	Plus	66737-86843
403739	7630882	Plus	44563-44766,48209-48483,52255-52495
403740	7630882	Plus	86504-87227
403745	7652036	Minus	67610-68002
403746	7652036	Plus	93612-93887
403885	7710403	Minus	53259-53524
403893	7710581	Minus	5435-7846
403947	7711923	Plus	38657-38817
404039	6698763	Plus	61889-62011
404054	3548785	Plus	66713-69175
404058	3548785	Plus	99397-101808
404106	6247074	Minus	63603-64942
404211	5006246	Plus	185728-185885,194575-194686
404277	1834458	Minus	91665-91946
404364	8887028	Minus	36055-38156,42175-42391,43435-43553
404407	7329316	Minus	48154-48499
404489	8113772	Plus	98183-98480
404527	8152087	Plus	127737-127796,128080-128210,129888-130054,132545-132869

404528	8152087	Plus	135325-135486
404661	9797073	Plus	33374-33675,33769-34008
404663	9797133	Plus	29885-30514
404956	7387343	Plus	55883-56203
405011	6139150	Plus	117359-117612
405044	7596797	Minus	98903-101141
405102	8076881	Minus	120922-121296
405109	8096886	Minus	30301-30518
405188	6649489	Plus	134573-134678
405231	7249032	Minus	109793-109969
405365	2275192	Minus	119867-120372,120481-120824,121029-121357
405387	6587915	Minus	3769-3833,5708-5895
405396	6624129	Minus	89965-90273
405429	7321905	Minus	51577-51723
405435	7408068	Minus	51704-51841,53581-53767
405446	7582529	Plus	99136-99313
405503	9211311	Minus	51198-51314
405525	9558552	Minus	19699-19828
405529	9581957	Minus	38944-39213
405610	5757553	Minus	71907-72080
405802	5924004	Minus	27743-28264
405811	4902753	Plus	5128-5248
406180	7283201	Minus	38923-39107
406207	5923650	Minus	162607-162800
406302	8575868	Plus	168961-169150,169610-169769

Table 3A shows the Seq ID No, Pkey, ExAccn, UnigeneID, and Unigene Title for all of the sequences in Table 4.

Pkey: Unique Eos probeset identifier number
ExAccn: Exemplar Accession number, Genbank accession number
UnigeneID: Unigene number
Unigene Title: Unigene gene title
Seq ID No: Seq ID number correlation for those sequences in Table 4

Pkey	ExAccn	UnigeneID	Unigene Title	Seq ID No
415539	AI733881	Hs.72472	BMP-R1B	Seq ID No 1 & 2
448988	Y09763	Hs.22785	gamma-aminobutyric acid (GABA) A recepto	Seq ID No 3-10
403740			NM_001076*:Homo sapiens UDP glycosyltran	Seq ID No 11 & 12
408633	AW963372	Hs.46677	PRO2000 protein	Seq ID No 13 & 14
408660	AA525775		ESTs, Moderately similar to PC4259 ferri	Seq ID No 15 & 16
409051	AA080912		gb:zn04d03.r1 Stratagene hNT neuron (937	Seq ID No 17
409123	AA063403		gb:zm04d12.s1 Stratagene corneal stroma	Seq ID No 18
415787	H01463	Hs.93534	ESTs	Seq ID No 19-21
415999	AA172179	Hs.294029	ESTs	Seq ID No 22
416225	AA577730	Hs.188684	ESTs, Weakly similar to PC4259 ferritin	Seq ID No 23
420757	X78592	Hs.99915	androgen receptor (dihydrotestosterone r	Seq ID No 24 & 25
429163	AA884766		gb:am20a10.s1 Soares_NFL_T_GBC_S1 Homo s	Seq ID No 26
429441	AJ224172	Hs.204096	lipophilin B (uteroglobin family member)	Seq ID No 27 & 28
431099	Y13367	Hs.249235	phosphoinositide-3-kinase, class 2, alph	Seq ID No 29 & 30
432432	AA541323	Hs.115831	ESTs	Seq ID No 31
432435	BE218886	Hs.282070	ESTs	Seq ID No 32 & 33
432527	AW975028	Hs.102754	ESTs	Seq ID No 34
435876	AW612586	Hs.160271	G protein-coupled receptor 48	Seq ID No 35 & 36
438233	W52448	Hs.56147	ESTs	Seq ID No 37-40
439569	AW602166	Hs.222399	CEGP1 protein	Seq ID No 41 & 42
440819	AI809444	Hs.202108	ESTs	Seq ID No 43
442832	AW206560	Hs.253569	ESTs	Seq ID No 44
447342	AI199268	Hs.19322	Homo sapiens, Similar to RIKEN cDNA 2010	Seq ID No 45 & 46
447499	AW262580	Hs.147674	protocadherin beta 16	Seq ID No 47 & 48
451411	AA017492	Hs.135655	EST	Seq ID No 49
451720	AW970985	Hs.290853	ESTs	Seq ID No 50 & 51

Table 3B shows the accession numbers for those Pkey's lacking UnigeneID's for table 3A. For each probeset is listed gene cluster number from which oligonucleotides were designed. Gene clusters were compiled using sequences derived from Genbank ESTs and mRNAs. These sequences were clustered based on sequence similarity using Clustering and Alignment Tools (DoubleTwist, Oakland California). Genbank accession numbers for sequences comprising each cluster are listed in the "Accession" column.

Pkey	CAT Number	Accession
408660	107294_1	AA525775 AA056342 AI538978 AW975281 AA664986
409051	109699_1	AA080912 AA075318 AA083403 AA076594 AA078992 AA084926 AA081881 AA113913 AA113892 AA083821 AA134801 AA082953 AA070343 AA062835 AA075419 AA063293 AA071252 AA078900 AA062836 AW974305
409123	110143_1	AA063403 AA070823 AA070050
429163	300543_1	AA884766 AW974271 AA592975 AA447312

Table 3C shows genomic positioning for those Pkey's lacking Unigene ID's and accession numbers in table 3A. For each predicted exon is listed genomic sequence source used for prediction. Nucleotide locations of each predicted exon are also listed.

Pkey	Ref	Strand	Nt_position
403740	7630882	Plus	86504-87227

Table 4:

Seq ID NO: 1 DNA sequence
Nucleic Acid Accession #: NM_001203
Coding sequence: 274..1782

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1          11         21         31         41         51
|          |          |          |          |          |
CGCCGCGCGC GCACTCGGCG GGGCCTCGCG GGACGCGGGC AGTGCGGAGA CCGCGGCGCT    60
GAGGACGCGG GAGCCGGGAG CGCACGCGCG GGGTGGAGTT CAGCCTACTC TTTCTTAGAT   120
GTGAAAGGAA ACGAAGATCA TTTCATGCCT TGTTGATAAA GGTTCAGACT TCTGCTGATT   180
CATAACCATT TGGCTCTGAG CTATGACAAG AGAGGAAACA AAAAGTTAAA CTTACAAGCC   240
TGCCATAAGT GAGAAGCAAA CTTCCTTGAT AACATGCTTT TGCGAAGTGC AGGAAAATTA   300
AATGTGGGCA CCAAGAAACA GGATGGTGAG AGTACAGCCC CCACCCCCCG TCCAAAGGTC   360
TTGCGTTGTA AATGCCACCA CCATTGTCCA GAAGACTCAG TCAACAATAT TTGCAGCACA   420
GACGGATATT GTTTCACGAT GATAGAAGAG GATGACTCTG GGTTGCCTGT GGTCACTTCT   480
GGTTGCCTAG GACTAGAAGG CTCAGATTTT CAGTGTCGGG ACACTCCCAT TCCTCATCAA   540
AGAAGATCAA TTGAATGCTG CACAGAAAGG AACGAATGTA ATAAAGACCT ACACCCTACA   600
CTGCCTCCAT TGAAAAACAG AGATTTTGTT GATGGACCTA TACACCACAG GGCTTTACTT   660
ATATCTGTGA CTGTCTGTAG TTTGCTCTTG GTCCTTATCA TATTATTTTG TTACTTCCGG   720
TATAAAAGAC AAGAAACCAG ACCTCGATAC AGCATTGGGT TAGAACAGGA TGAAACTTAC   780
ATTCCTCCTG GAGAATCCCT GAGAGACTTA ATTGAGCAGT CTCAGAGCTC AGGAAGTGGA   840
TCAGGCCTCC CTCTGCTGGT CCAAAGGACT ATAGCTAAGC AGATTCAGAT GGTGAAACAG   900
ATTGGAAAAG GTCGCTATGG GGAAGTTTGG ATGGGAAAGT GGCGTGGCGA AAAGGTAGCT   960
GTGAAAGTGT TCTTCACCAC AGAGGAAGCC AGCTGGTTCA GAGAGACAGA AATATATCAG  1020
ACAGTGTTGA TGAGGCATGA AAACATTTTG GGTTTCATTG CTGCAGATAT CAAAGGGACA  1080
GGGTCCTGGA CCCAGTTGTA CCTAATCACA GACTATCATG AAAATGGTTC CCTTTATGAT  1140
TATCTGAAGT CCACCACCCT AGACGCTAAA TCAATGCTGA AGTTAGCCTA CTCTTCTGTC  1200
ACTGGCTTAT GTCATTTACA CACAGAAATC TTTAGTACTC AAGGCAAACC AGCAATTGCC  1260
CATCGAGATC TGAAAAGTAA AAACATTCTG GTGAAGAAAA ATGGAACTTG CTGTATTGCT  1320
GACCTGGGCC TGGCTGTTAA ATTTATTAGT GATACAAATG AAGTTGACAT ACCACCTAAC  1380
ACTCGACTTG GCACCAAACG CTATATGCCT CCAGAAGTGT TGGACGAGAG CTTGAACAGA  1440
AATCACTTCC AGTCTTACAT CATGGCTGAC ATGTATAGTT TTGGCCTCAT CCTTTGGGAG  1500
GTTGCTAGGA GATGTGTATC AGGAGGTATA GTGGAAGAAT ACCAGCTTCC TTATCATGAC  1560
CTAGTGCCCA GTGACCCCTC TTATGAGGAC ATGAGGGAGA TTGTGTGCAT CAAGAAGTTA  1620
CGCCCCTCAT TCCCAAACCG GTGGAGCAGT GATGAGTGTC TAAGGCAGAT GGGAAAACTC  1680
ATGACAGAAT GCTGGGCTCA CAATCCTGCA TCAAGGCTGA CAGCCCTGCG GGTTAAGAAA  1740
ACACTTGCCA AAATGTCAGA GTCCCAGGAC ATTAAACTCT GATAGGAGAG GAAAAGTAAG  1800
CATCTCTGCA GAAAGCCAAC AGGTACTCTT CTGTTTGTGG GCAGAGCAAA AGACATCAAA  1860
TAAGCATCCA CAGTACAAGC CTTGAACATC GTCCTGCTTC CCAGTGGGTT CAGACCTCAC  1920
CITTCAGGGA GCGACCTGGG CAAAGACAGA GAAGCTCCCA GAAGGAGAGA TTGATCCGTG  1980
TCTGTTTGTA GGCGGAGAAA CCGTTGGGTA ACTTGTTCAA GATATGATGC AT
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Seq ID NO: 2 Protein sequence
Protein Accession #: NP_001194

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1          11         21         31         41         51
|          |          |          |          |          |
MLLRSAGKLN VGTKKEDGES TAPTPRPKVL RCKCHHHCPE DSVNNICSTD GYCFTMIEED    60
DSGLPVVTSG CLGLEGSDFQ CRDTPIPHQR RSIECCTERN ECNKDLHPTL PPLKNRDFVD   120
GPIHHRALLI SVTVCSLLLV LIILFCYFRY KRQETRPRYS IGLEQDETYI PPGESLRDLI   180
EQSQSSGSGS GLPLLVQRTI AKQIQMVKQI GKGRYGEVWM GKWRGEKVAV KVFFTTEEAS   240
WFRETEIYQT VLMRHENILG FIAADIKGTG SWTQLYLITD YHENGSLYDY LKSTTLDAKS   300
MLKLAYSSVS GLCHLHTEIF STQGKPAIAH RDLKSKNILV KKNGTCCIAD LGLAVKFISD   360
TNEVDIPPNT RVGTKRYMPP EVLDESLNRN HFQSYIMADM YSFGLILWEV ARRCVSGGIV   420
EEYQLPYHDL VPSDPSYEDM REIVCIKKLR PSFPNRWSSD ECLRQMGKLM TECWAHNPAS   480
RLTALRVKKT LAKMSESQDI KL
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Seq ID NO: 3 DNA sequence
Nucleic Acid Accession #: NM_004961.2
Coding sequence: 55..1575

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1          11         21         31         41         51
|          |          |          |          |          |
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TCCAAAGTTC TTCCAGTCCT CCTAGGCATC TTATTGATCC TCCAGTCGAG GGTCGAGGGA   120
CCTCAGACTG AATCAAAGAA TGAAGCCTCT TCCCGTGATG TTGTCTATGG CCCCCAGCCC   180
CAGCCTCTGG AAAATCAGCT CCTCTCTGAG GAAACAAAGT CAACTGAGAC TGAGACTGGG   240
AGCACAGTTG GCAAACTGCC AGAAGCCTCT CGCATCCTGA ACACTATCCT GAGTAATTAT   300
GACCACAAAC TGCGCCCTGG CATTGGAGAG AAGCCCACTG TGGTCACTGT TGAGATCGCC   360
GTCAACAGCC TTCGTCCTCT CTCTATCCTA GACATGGAAT ACACCATTGA CATCATCTTC   420
TCCCAGACCT GGTACGACGA ACGCCTCTGT TACAACGACA CCTTTGAGTC TCTTGTTCTG   480
AATGCCAATG TGCTGAGCCA GCTATGGATC CCGGACACCT TTTTTAGGAA TTCTAAGAGG   540
ACCCACGAGC ATGAGATCAC CATGCCCAAC CAGATGGTCC GCATCTACAA GGATGGCAAG   600
GTGTTGTACA CAATTAGGAT GACCATTGAT GCCGGATGCT CACTCCACAT GCTCAGATTT   660
CCAATGGATT CTCACTCTTG CCCTCTATCT TTCTCTAGCT TTTCCTATCC TGAGAATGAG   720
ATGATCTACA AGTGGGAAAA TTTCAAGCTT GAAATCAATG AGAAGAACTC CTGGAAGCTC   780
TTCCAGTTTG ATTTTACAGG AGTGAGCAAC AAAACTGAAA TAATCACAAC CCCAGTTGGT   840
GACTTCATGG TCATGACGAT TTTCTTCAAT GTGAGCAGGC GGTTTGGCTA TGTTGCCTTT   900
CAAAACTATG TCCCTTCTTC CGTGACCACG ATGCTCTCCT GGGTTTCCTT TTGGATCAAG   960
ACAGAGTCTG CTCCAGCCCG GACCTCTCTA GGGATCACCT CTGTTCTGAC CATGACCACG  1020
TTGGCCACCT TTTCTCGTAA GAATTTCCCG CGTGTCTCCT ATATCACAGC CTTGGATTTC  1080
TATATCGCCA TCTGCTTCGT CTTCTGCTTC TGCGCTCTGT TGGAGTTTGC TGTGCTCAAC  1140
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TTCCTCATCT ACAACCAGAC AAAAGCCCAT GCTTCTCCTA AACTCCGCCA TCCTCGTATC  1200
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GAAGCTTTTG TGTGCCAGAT TGTCACCACT GAGGGAAGTG ATGGAGAGGA GCGCCCGTCT  1320
TGCTCAGCCC ACCAGCCCCC TAGCCCAGGT AGCCCTGAGG GTCCCCGCAG CCTCTGCTCC  1380
AAGCTCGCCT GCTGTGAGTG GTGCAAGCGT TTTAAGAAGT ACTTCTGCAT GGTCCCCGAT  1440
TGTGAGGGCA GTACCTGGCA GCAGGGCCGC CTCTGCATCC ATGTCTACCG CCTGGATAAC  1500
TACTCCAGAG TTGTTTTCCC AGTGACTTTC TTCTTCTTCA ATGTGCTCTA CTGGCTTGTT  1560
TGCCTTAACT TGTAGGTACC AGCTGGTACC CTGTGGGGCA ACCTCTCCAG TTCCCCAGGA  1620
GGTCCAAGCC CCTTGCCAAG GGAGTTGGGG GAAAGCAGCA GCAGCAGCAG GAGCGACTAG  1680
AGTTTTTCCT GCCCCATTCC CCAAACAGAA GCTTGCAGAG GGTTTGTCTT TGCTGCCCCT  1740
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ACTACCAATT CAATGCCCTT CATCCAATGG GTATCTATTT TTGTGTGTGA TTATAGTAAC  2340
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ACTTTCCCAG TCACTTCCCC TAGCCCTGAC CCAGGCACTA GGCCTTGGTG ACTTCCTGGG  2460
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CACTGTTATA CCCGCGGCAC TCTAACCATC ACAATCAATC AATCAAATTC CCTTAAATTT  2640
GTATGGCACT GGAACTTTGG CAAAGCACTT TTGACAAGTT GTGTCTGATT GGAGCTTCAT  2700
GATAGCCTTG TGACATCTTT AGGGCAGGAT TCTTATCCCC ATTTTGCAGA TGAAAACCCT  2760
GAGTCACACA TTTCTGTGGG ACTGTGGATC TCACTGGAAG CTATCCAAGA GCCCACTGTC  2820
ACCTTCTAGA CCACATGATA GGGCTAGACA GCTCAGTTCA CCATGATTCT CTTCTGTCAC  2880
CTCTGCTGGC ACACCAGTGG CAAGGCCCAG AATGGCGACC TCTCTTTAGC TCAATTTCTG  2940
GGCCTGAGGT GCTCAGACTG CCCCCAAGAT CAAATCTCTC CTGGCTGTAG TAACCCAGTG  3000
GAATGAATTT GGACATGCCC CAATGCTTCT ATATGCTAAG TGAAATCTGT GTCTGTAATT  3060
TCTTGGGGCG TGGATAGGGT GGGGTCTCCA TCTACTTTTT GTCACCATCA TCTGAAATGG  3120
GGAAATATGT AAATAAATAT ATCAGCAAAG CAAAAAGAAA AAAAAAAA
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Seq ID NO: 4 Protein sequence
Protein Accession #: NP_004952.1

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1          11         21         31         41         51
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TGSRVGKLPE ASRILNTILS NYDHKLRPGI GEKPTVVTVE IAVNSLGPLS ILDMEYTIDI   120
IFSQTWYDER LCYNDTFESL VLNGNVVSQL WIPDTFFRNS KRTHEHEITM PNQMVRIYKD   180
GKVLYTIRMT IDAGCSLHML RFPMDSHSCP LSFSSFSYPE NEMIYKWENF KLEINEKNSW   240
KLFQFDFTGV SNKTEIITTP VGDFMVMTIF FNVSRRFGYV AFQNYVPSSV TTMLSWVSFW   300
IKTESAPART SLGITSVLTM TTLGTFSRKN FPRVSYITAL DFYIAICFVF CFCALLEFAV   360
LNFLIYNQTK AHASPKLRHP RINSRAHART RARSRACARQ HQEAFVCQIV TTEGSDGEER   420
PSCSAQQPPS PGSPEGPRSL CSKLACCEWC KRFKKYFCMV PDCEGSTWQQ GRLCIHVYRL   480
DNYSRVVFPV TFFFFNVLYW LVCLNL
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Seq ID NO: 5 DNA sequence
Nucleic Acid Accession #: NM_021984.1
Coding sequence: 572..1753

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TCCAAAGTTC TTCCAGTCCT CCTAGGCATC TTATTGATCC TCCAGTCGAG AACATGTATA   120
CAGAGAAGTG CTCAAATCAT AAGTGTACAG CTGATGAGTT GTCAAAAAAT GACCACAGCG   180
GTGTAAAGAA AGCCAAATCA AGGACCCGAA TGTGAGCAGG ACCTCAGAAG CCCCCCTTGT   240
CACTGCCTCC CAGCAAAGGC AGCACTATCC GGACTTCTAA CACCATCGGG TCGAGGGACC   300
TCAGACTGAA TCAAAGAATG AAGCCTCTTC CCGTGATGTT GTCTATGGCC CCCAGCCCCA   360
GCCTCTCGAA AATCAGCTCC TCTCTGAGGA AACAAAGTCA ACTGAGACTG AGACTGGGAG   420
CAGAGTTGCC AAACTGCCAG AAGCCTCTCG CATCCTGAAC ACTATCCTGA GTAATTATGA   480
CCACAAACTG CGCCCTGCCA TTGGAGAGAA GCCCACTGTG GTCACTGTTG AGATCTCCGT   540
CAACAGCCTT GGTCCTCTCT CTATCCTAGA CATGGAATAC ACCATTGACA TCATCTTCTC   600
CCAGACCTGG TACGACGAAC GCCTCTGTTA CAACGACACC TTTGAGTCTC TTGTTCTGAA   660
TGGCAATGTG GTGAGCCAGC TATGGATCCC GGACACCTTT TTTAGGAATT CTAAGAGGAC   720
CCACGACCAT GACATCACCA TGCCCAACCA GATGGTCCGC ATCTACAAGG ATGGCAAGGT   780
GTTGTACACA ATTAGGATGA CCATTGATGC CGGATGCTCA CTCCACATGC TCAGATTTCC   840
AATGGATTCT CACTCTTCCC CTCTATCTTT CTCTAGCTTT TCCTATCCTG AGAATGAGAT   900
GATCTACAAG TGCGAAAATT TCAAGCTTGA AATCAATGAG AAGAACTCCT GGAAGCTCTT   960
CCAGTTGGAT TTTACAGGAG TGAGCAACAA AACTGAAATA ATCACAACCC CAGTTGGTGA  1020
CTTCATCGTC ATGACGATTT TCTTCAATGT GAGCAGGCGG TTTGGCTATG TTGCCTTTCA  1080
AAACTATGTC CCTTCTTCCG TGACCACGAT GCTCTCCTGG GTTTCCTTTT GGATCAAGAC  1140
AGAGTCTGCT CCAGCCCGGA CCTCTCTAGG GATCACCTCT GTTCTGACCA TGACCACGTT  1200
GGGCACCTTT TCTCGTAAGA ATTTCCCGCG TGTCTCCTAT ATCACAGCCT TGGATTTCTA  1260
TATCGCCATC TGCTTCGTCT TCTGCTTCTG CGCTCTGTTG GAGTTTGCTG TGCTCAACTT  1320
CCTGATCTAC AACCAGACAA AAGCCCATGC TTCTCCTAAA CTCCGCCATC CTCGTATCAA  1380
TAGCCGTGCC CATGCCCGTA CCCGTGCACG TTCCCGAGCC TGTGCCCGCC AACATCAGGA  1440
AGCTTTTGTG TGCCAGATTG TCACCACTGA GGGAAGTGAT GGAGAGGAGC GCCCGTCTTG  1500
CTCAGCCCAG CAGCCCCCTA GCCCAGGTAG CCCTGAGGGT CCCCGCAGCC TCTGCTCCAA  1560
GCTCGCCTCC TCTGAGTGGT GCAAGCGTTT TAACAAGTAC TTCTGCATGG TCCCCGATTG  1620
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TGACGCCAGT ACCTGGCAGC AGGCCCGCCT CTGCATCCAT GTCTACCGCC TGGATAACTA  1680
CTCGAGAGTT GTTTTCCCAG TGACTTTCTT CTTCTTCAAT GTGCTCTACT GGCTTGTTTG  1740
CCTTAACTTG TAGGTACCAG CTGGTACCCT GTGGGGCAAC CTCTCCAGTT CCCCAGGAGG  1800
TCCAAGCCCC TTGCCAAGGG AGTTGGGGGA AAGCAGCAGC AGCAGCAGGA GCGACTAGAG  1860
TTTTTCCTGC CCCATTCCCC AAACAGAAGC TTGCAGAGGG TTTGTCTTTG CTGCCCCTCT  1920
CCCCTACCTG GCCCATTCAC TGAGTTTTCT CAGCAGACCA TTTCAAATTA TTAATAAATG  1980
GGCCACCTCC CTCTTCTTCA AGGAGCATCC GTGATGCTCA GTGTTCAAAA CCACAGCCAC  2040
TTAGTGATCA GCTCCCTAAA ACCATGCCTA AGTACAGGCG GATTAGCTAT CTTCCAACAA  2100
TGCTGACCAC CAGACAATTA CTGCATTTTT CCAGAAGCCC ACTATTGCCT TTGCAGTGCT  2160
TTCGGCCCAG TTCTGGCCTC AGCCTCAAAG TGCACCGACT AGTTGCTTGC CTATACCTGG  2220
CACCTCATTA AGATGCTGGG CAGCAGTATA ACAGGAGGAA GAGATCCCTC TCCTTTGGTC  2280
AGATTATTAT GTTCTCAGTT CTCTCTCCCT GCTACCCCTT TCTCTGCAGA TAGATAGACA  2340
CTGCCATTAT CCCTTTAGGA AGAGGGGGGG GCAGCAAGAG AGCCTATTTG GGACAGCATT  2400
CCTCTCTCTC TGCTGCTGTG ACATCTCCCT CTCCTTGCTG GCTCCATCTT TCGTCTGCAC  2460
TACCAATTCA ATGCCCTTCA TCCAATGGGT ATCTATTTTT GTGTGTGATT ATAGTAACTA  2520
CTCCCTGCTT TATATGCCAC CCTCTTCCTT CTCTTTGACC CCTGTGACTC TTTCTGTAAC  2580
TTTCCCAGTG ACTTCCCCTA GCCCTGACCC AGGCACTAGG CCTTGGTGAC TTCCTGGGGC  2640
CAACAAACTA AGGAAACTCG GCTTTGCAAC AGGCATTACT CGCCATTGAT TGGTGCCCAC  2700
CCACGGCACA CTGTCGCAGT TCTATCACTT GCTTGACCCC TGGACCCATA AACCAGTCCA  2760
CTGTTATACC CGGGGCACTC TAACCATCAC AATCAATCAA TCAAATTCCC TTAAATTTGT  2820
ATGGCACTGG AACTTTGGCA AAGCACTTTT GACAAGTTGT GTCTGATTGG AGCTTCATGA  2880
TAGCCTTGTG ACATCTTTAG GGCAGGATTC TTATCCCCAT TTTGCAGATG AAAACCCTGA  2940
GTCACAGATT TCTGTGGGAC TGTGGATCTC ACTGGAAGCT ATCCAAGAGC CCACTGTCAC  3000
CTTCTAGACC ACATGATAGG GCTAGACAGC TCAGTTCACC ATGATTCTCT TCTGTCACCT  3060
CTGCTGGCAC ACCAGTGGCA AGGCCCAGAA TGGCGACCTC TCTTTAGCTC AATTTCTGGG  3120
CCTGAGGTGC TCAGACTGCC CCCAAGATCA AATCTCTCCT GGCTGTAGTA ACCCAGTGGA  3180
ATGAATTTGG ACATGCCCCA ATGCTTCTAT ATGCTAAGTG AAATCTGTGT CTGTAATTTG  3240
TTGGGGGGTG GATAGGGTGG GGTCTCCATC TACTTTTTGT CACCATCATC TGAAATGGGG  3300
AAATATGTAA ATAAATATAT CAGCAAAGC
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Seq ID NO: 6 Protein sequence
Protein Accession #: NP_068819.1

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1          11         21         31         41         51
|          |          |          |          |          |
MEYTIDIIFS QTWYDERLCY NDTFESLVLN GNVVSQLWIP DTFFRNSKRT HEHEITMPNQ    60
MVRIYKDGKV LYTIRMTIDA GCSLHMLRFP MDSHSCPLSF SSFSYPENEM IYKWENFKLE   120
INEKNSWKLF QLDFTGVSNK TEIITTPVGD FMVMTIFFNV SRRFGYVAFQ NYVPSSVTTM   180
LSWVSFWIKT ESAPARTSLG ITSVLTMTTL GTFSRKNFPR VSYITALDFY IAICFVFCFC   240
ALLEFAVLNF LIYNQTKAHA SPKLRHPRIN SRAHARTRAR SRACARQHQE AFVCQIVTTE   300
GSDGEERPSC SAQQPPSPGS PEGPRSLCSK LACCEWCKRF KKYFCMVPDC EGSTWQQARL   360
CIHVYRLDNY SRVVFPVTFF FFNVLYWLVC LNL
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Seq ID NO: 7 DNA sequence
Nucleic Acid Accession #: NM_021987.1
Coding sequence: 572..1657

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TCCAAAGTTC TTCCAGTCCT CCTAGGCATC TTATTGATCC TCCAGTCGAG AACATGTATA   120
CAGAGAAGTG CTCAAATCAT AAGTGTACAG CTGATGAGTT GTCAAAAAAT GACCACAGCG   180
GTGTAAAGAA AGCCAAATCA AGGACCCGAA TGTGAGCAGG ACCTCAGAAG CCCCCTTTGT   240
CACTGCCTCC CAGCAAAGGC AGCACTATCC GGACTTCTAA CACCATCGGG TCGAGGGACC   300
TCAGACTGAA TCAAAGAATG AAGCCTCTTC CCGTGATGTT GTCTATGGCC CCCAGCCCCA   360
GCCTCTGGAA AATCAGCTCC TCTCTGAGGA AACAAAGTCA ACTGAGACTG AGACTGGGAG   420
CAGAGTTGGC AAACTGCCAG AAGCCTCTCG CATCCTGAAC ACTATCCTGA GTAATTATGA   480
CCACAAACTG CGCCCTGGCA TTGGAGAGAA GCCCACTGTG GTCACTGTTG AGATCTCCGT   540
CAACAGCCTT GGTCCTCTCT CTATCCTAGA CATGGAATAC ACCATTGACA TCATCTTCTC   600
CCAGACCTGG AATTCTAAGA GGACCCACGA GCATGAGATC ACCATGCCCA ACCAGATGGT   660
CCGCATCTAC AAGGATGGCA AGGTGTTGTA CACAATTAGG ATGACCATTG ATGCCGGATG   720
CTCACTCCAC ATGCTCAGAT TTCCAATGGA TTCTCACTCT TGCCCTCTAT CTTTCTCTAG   780
CTTTTCCTAT CCTGAGAATG AGATGATCTA CAAGTGGGAA AATTTCAAGC TTGAAATCAA   840
TGAGAAGAAC TCCTGGAAGC TCTTCCAGTT TGATTTTACA GGAGTGAGCA ACAAAACTGA   900
AATAATCACA ACCCCAGTTG GTGACTTCAT GGTCATGACG ATTTTCTTCA ATGTGAGCAG   960
GCGCTTTGGC TATGTTGCCT TTCAAAACTA TGTCCCTTCT TCCGTGACCA CGATGCTCTC  1020
CTGGGTTTCC TTTTCGATCA AGACAGAGTC TGCTCCAGCC CGGACCTCTC TAGGGATCAC  1080
CTCTGTTCTG ACCATGACCA CGTTGGGCAC CTTTTCTCGT AAGAATTTCC CGCGTGTCTC  1140
CTATATCACA GCCTTGGATT TCTATATCGC CATCTGCTTC GTCTTCTGCT TCTGCGCTCT  1200
GTTGGAGTTT GCTGTGCTCA ACTTCCTGAT CTACAACCAG ACAAAAGCCC ATGCTTCTCC  1260
TAAACTCCCC CATCCTCGTA TCAATAGCCG TGCCCATGCC CGTACCCGTG CACGTTCCCG  1320
AGCCTGTGCC CGCCAACATC AGGAAGCTTT TGTGTGCCAG ATTGTCACCA CTGAGGGAAG  1380
TGATGGAGAG GAGCCCCCGT CTTGCTCAGC CCAGCAGCCC CCTAGCCCAG GTAGCCCTGA  1440
GCGTCCCCCC AGCCTCTGCT CCAAGCTGGC CTGCTGTGAG TGGTGCAAGC GTTTTAAGAA  1500
GTACTTCTGC ATGGTCCCCG ATTGTGAGGG CAGTACCTGG CAGCAGGGCC GCCTCTGCAT  1560
CCATGTCTAC CGCCTGGATA ACTACTCGAG AGTTGTTTTC CCAGTGACTT TCTTCTTCTT  1620
CAATGTGCTC TACTGGCTTG TTTGCCTTAA CTTGTAGGTA CCAGCTGGTA CCCTGTGGGG  1680
CAACCTCTCC AGTTCCCCAG GAGGTCCAAG CCCCTTGCCA AGGGAGTTGG GGGAAAGCAG  1740
CAGCAGCACC AGGAGCGACT AGAGTTTTTC CTGCCCCATT CCCCAAACAG AAGCTTGCAG  1800
AGGGTTTGTC TTTGCTGCCC CTCTCCCCTA CCTGGCCCAT TCACTGAGTT TTCTCAGCAG  1860
ACCATTTCAA ATTATTAATA AATGGGCCAC CTCCCTCTTC TTCAAGGAGC ATCCGTGATG  1920
CTCAGTGTTC AAAACCACAG CCACTTAGTG ATCAGCTCCC TAAAACCATG CCTAAGTACA  1980
GGCGGATTAG CTATCTTCCA ACAATGCTGA CCACCAGACA ATTACTGCAT TTTTCCAGAA  2040
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GCCCACTATT GCCTTTGCAG TGCTTTCGGC CCAGTTCTGG CCTCAGCCTC AAAGTGCACC  2100
GACTAGTTGC TTGCCTATAC CTGGCACCTC ATTAAGATGC TGGGCAGCAG TATAACAGGA  2160
GGAAGAGATC CCTCTCCTTT GGTCAGATTA TTATGTTCTC AGTTCTCTCT CCCTGCTACC  2220
CCTTTCTCTG CAGATACATA GACACTGGCA TTATCCCTTT AGGAAGAGGG GGGGGCAGCA  2280
AGAGAGCCTA TTTGGGACAG CATTCCTCTC TCTCTGCTGC TGTGACATCT CCCTCTCCTT  2340
GCTGGCTCCA TCTTTCGTCT GCACTACCAA TTCAATGCCC TTCATCCAAT GGGTATCTAT  2400
TTTTGTCTCT GATTATAGTA ACTACTCCCT GCTTTATATG CCACCCTCTT CCTTCTCTTT  2460
GACCCCTGTG ACTCTTTCTG TAACTTTCCC AGTGACTTCC CCTAGCCCTG ACCAGGCACT  2520
ACGCCTTGCT GACTTCCTGG GGCCAAGAAA CTAAGGAAAC TCGGCTTTGC AACAGGCATT  2580
ACTCGCCATT GATTGGTGCC CACCCAGGGC ACACTGTCGG AGTTCTATCA CTTGCTTGAC  2640
CCCTGGACCC ATAAACCAGT CCACTGTTAT ACCCGGGGCA CTCTAACCAT CACAATCAAT  2700
CAATCAAATT CCCTTAAATT TGTATGGCAC TGGAACTTTG GCAAAGCACT TTTGACAAGT  2760
TGTGTCTGAT TGGAGCTTCA TGATAGCCTT GTGACATCTT TAGGGCAGGA TTCTTATCCC  2820
CATTTTGCAG ATGAAAACCC TGAGTCACAG ATTTCTGTGG GACTGTGGAT CTCACTGGAA  2880
GCTATCCAAG AGCCCACTGT CACCTTCTAG ACCACATGAT AGGGCTAGAC AGCTCAGTTC  2940
ACCATGATTC TCTTCTGTCA CCTCTGCTGG CACACCAGTG GCAAGGCCCA GAATGGCGAC  3000
CTCTCTTTAG CTCAATTTCT GGGCCTGAGG TGCTCAGACT GCCCCCAAGA TCAAATCTCT  3060
CCTGGCTGTA GTAACCCAGT GGAATGAATT TGGACATGCC CCAATGCTTC TATATGCTAA  3120
GTGAAATCTG TGTCTGTAAT TTGTTGGGGG GTGGATAGGG TGGGGTCTCC ATCTACTTTT  3180
TGTCACCATC ATCTGAAATG GGGAAATATG TAAATAAATA TATCAGCAAA GC
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Seq ID NO: 8 Protein sequence
Protein Accession #: NP_068822.1

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1          11         21         31         41         51
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MEYTIDIIFS QTWNSKRTHE HEITMPNQMV RIYKDGKVLY TIRMTIDAGC SLHMLRFPMD    60
SHSCPLSFSS FSYPENEMIY KWENFKLEIN EKNSWKLFQF DFTGVSNKTE IITTPVGDFM   120
VMTIFFNVSR RFGYVAFQNY VPSSVTTMLS WVSFWIKTES APARTSLGIT SVLTMTTLGT   180
FSRKNFPRVS YITALDFYIA ICFVFCFCAL LEFAVLNFLI YNQTKAHASP KLRHPRINSR   240
AHARTRARSR ACARQHQEAF VCQIVTTEGS DGEERPSCSA QQPPSPGSPE GPRSLCSKLA   300
CCEWCKRFKK YFCMVPDCEG STWQQGRLCI HVYRLDNYSR VVFPVTFFFF NVLYWLVCLN   360
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Seq ID NO: 9 DNA sequence
Nucleic Acid Accession #: NM_021990.1
Coding sequence: 1309..2490

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1          11         21         31         41         51
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TCCAAAGTTC TTCCAGTCCT CCTAGGCATC TTATTGATCC TCCAGTCGAG AACATGTATA   120
CAGAGAAGTG CTCAAATCAT AAGTGTACAG CTGATGAGTT GTCAAAAAAT GACCACAGCG   180
GTGTAAAGAA AGCCAAATCA AGGACCCGAA TGTGAGCAGG ACCTCAGAAG CCCCCTTTGT   240
CACTGCCTCC CAGCAAAGGC AGCACTATCC GGACTTCTAA CACCATCGGT GAGTTTCATA   300
CCTTGGCAGA TGGCCTTTAA CATTTTTGTT TAATTCAATT ATTCTTACTA ATCTTCTTCT   360
TTTTCTTGGC TGTGGTGCAT GGCTGTGGAG CTCAGGGTGG ACTCCTGTTG GGCAGCCAGT   420
TCCTGGATGG CTGTCTGTGG GTGGAGGACT CCTGCCTTTC CTGTTTAGAC ACCCACAAAG   480
GCTGCTCTTT AGCCTCCTTC CCTTCATCCC CTTCCCCTGC CCCCAGTGCA ACGAGTATTA   540
CACAACCAAC AAAACCGCAA AATATTCCCA CAATTTTCTG GTCCTCTCTG GGAGAGGCCG   600
CTCTGGCTTT TCCTCTCAGC CCTGGCCCTC TGCCTGCTCC TCACTCCTGG TTGGTGCTGG   660
TCAGGCTGAC TAGAGGCCAA GGCGACCAAC ACTAGGCAAA CGCGGCCAGC GCTCAGACAT   720
AAATGCCCTC TTCATTTCAC GTGTAACATT CTTTTAAAAT CTAGGTCTTG GTTTTGTTGA   780
TTTTTTCTTA AATAAAAGAG TGATCATAAA AGAGGGACAG CATAGAAAGT CCCCAAAGAG   840
CAGCAAGGTT TTAAAGAAAT TCACAAGCCT AATCTGTCAC TGTCTTATAA TTTGCTATTA   900
CCAGTCACAA TTTAACTAGG TTTTGTGTTG AAAACTTGTT TTGGTTTGCT TCTGTCCCAA   960
GAGGCACTAG CTGGGGCCCC TACAGAGTGC AGGGCAGAGC TTCATTTTTC GTTTGAATGT  1020
TCTAGGGTCG AGGGACCTCA GACTGAATCA AAGAATGAAG CCTCTTCCCG TGATGTTGTC  1080
TATCGCCCCC AGCCCCAGCC TCTGGAAAAT CAGCTCCTCT CTGAGGAAAC AAAGTCAACT  1140
GAGACTGAGA CTGGGAGCAG AGTTGGCAAA CTGCCAGAAG CCTCTCGCAT CCTGAACACT  1200
ATCCTGAGTA ATTATGACCA CAAACTGCGC CCTGGCATTG GAGAGAAGCC CACTGTGGTC  1260
ACTGTTCAGA TCTCCGTCAA CAGCCTTGGT CCTCTCTCTA TCCTAGACAT GGAATACACC  1320
ATTGACATCA TCTTCTCCCA GACCTGGTAC GACGAACGCC TCTGTTACAA CGACACCTTT  1380
GAGTCTCTTG TTCTGAATGG CAATGTGGTG AGCCAGCTAT GGATCCCGGA CACCTTTTTT  1440
AGCAATTCTA AGAGGACCCA CGAGCATGAG ATCACCATGC CCAACCAGAT GGTCCGCATC  1500
TACAAGCATG GCAACGTGTT GTACACAATT AGGATGACCA TTGATGCCGG ATGCTCACTC  1560
CACATGCTCA GATTTCCAAT GGATTCTCAC TCTTGCCCTC TATCTTTCTC TAGCTTTTCC  1620
TATCCTGAGA ATGAGATGAT CTACAAGTGG GAAAATTTCA AGCTTGAAAT CAATGAGAAG  1680
AACTCCTGCA AGCTCTTCCA GTTTGATTTT ACAGGAGTGA GCAACAAAAC TGAAATAATC  1740
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GGCTATGTTG CCTTTCAAAA CTATGTCCCT TCTTCCGTGA CCACGATGCT CTCCTGGGTT  1860
TCCTTTTGCA TCAACACAGA GTCTGCTCCA GCCCGGACCT CTCTAGGGAT CACCTCTGTT  1920
CTGACCATGA CCACGTTGGG CACCTTTTCT CGTAAGAATT TCCCGCGTGT CTCCTATATC  1980
ACAGCCTTCG ATTTCTATAT CGCCATCTGC TTCGTCTTCT GCTTCTGCGC TCTGTTGGAG  2040
TTTGCTCTGC TCAACTTCCT GATCTACAAC CAGACAAAAG CCCATGCTTC TCCTAAACTC  2100
CGCCATCCTC GTATCAATAG CCGTGCCCAT GCCCGTACCC GTGCACGTTC CCGAGCCTGT  2160
GCCCGCCAAC ATCAGGAAGC TTTTGTGTGC CAGATTGTCA CCACTGAGGG AAGTGATGGA  2220
GAGGAGCGCC CGTCTTGCTC AGCCCAGCAG CCCCCTAGCC CAGGTAGCCC TGAGGGTCCC  2280
CGCAGCCTCT GCTCCAAGCT GGCCTGCTGT GAGTGGTGCA AGCGTTTTAA GAAGTACTTC  2340
TCCATGGTCC CCGATTCTGA CGCCAGTACC TGGCAGCAGG GCCGCCTCTG CATCCATGTC  2400
TACCGCCTGG ATAACTACTC GAGAGTTGTT TTCCCAGTGA CTTTCTTCTT CTTCAATGTG  2460
CTCTACTGCC TTGTTTGCCT TAACTTGTAG GTACCAGCTG GTACCCTGTG GGGCAACCTC  2520
TCCAGTTCCC CAGGAGGTCC AAGCCCCTTG CCAAGGGAGT TGGGGGAAAG CAGCAGCAGC  2580
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ACCAGGAGCG ACTAGAGTTT TTCCTGCCCC ATTCCCCAAA CAGAAGCTTG CAGAGGGTTT  2640
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CAAATTATTA ATAAATGGGC CACCTCCCTC TTCTTCAAGG AGCATCCGTG ATGCTCAGTG  2760
TTCAAAACCA CAGCCACTTA GTGATCAGCT CCCTAAAACC ATGCCTAAGT ACAGGCGGAT  2820
TAGCTATCTT CCAACAATGC TGACCACCAG ACAATTACTG CATTTTTCCA GAAGCCCACT  2880
ATTGCCTTTG CAGTGCTTTC GGCCCAGTTC TGGCCTCAGC CTCAAAGTGC ACCGACTAGT  2940
TCCTTGCCTA TACCTGGCAC CTCATTAAGA TGCTGGGCAG CAGTATAACA GGAGGAAGAG  3000
ATCCCTCTCC TTTGGTCAGA TTATTATGTT CTCAGTTCTC TCTCCCTGCT ACCCCTTTCT  3060
CTGCAGATAG ATAGACACTG GCATTATCCC TTTAGGAAGA GGGGGGGGCA GCAAGAGAGC  3120
CTATTTCGCA CACCATTCCT CTCTCTCTGC TGCTGTGACA TCTCCCTCTC CTTGCTGGCT  3180
CCATCTTTCG TCTGCACTAC CAATTCAATG CCCTTCATCC AATGGGTATC TATTTTTGTG  3240
TCTGATTATA GTAACTACTC CCTGCTTTAT ATGCCACCCT CTTCCTTCTC TTTGACCCCT  3300
GTGACTCTTT CTGTAACTTT CCCAGTGACT TCCCCTAGCC CTGACCAGGC ACTAGGCCTT  3360
GGTGACTTCC TGGGGCCAAG AAACTAAGGA AACTCGGCTT TGCAACAGGC ATTACTCGCC  3420
ATTCATTGCT GCCCACCCAG GGCACACTGT CGGAGTTCTA TCACTTGCTT GACCCCTGGA  3480
CCCATAAACC AGTCCACTGT TATACCCGGG GCACTCTAAC CATCACAATC AATCAATCAA  3540
ATTCCCTTAA ATTTGTATGG CACTGGAACT TTGGCAAAGC ACTTTTGACA AGTTGTGTCT  3600
GATTGGAGCT TCATGATAGC CTTGTGACAT CTTTAGGGCA GGATTCTTAT CCCCATTTTG  3660
CAGATGAAAA CCCTGAGTCA CAGATTTCTG TGGGACTGTG GATCTCACTG GAAGCTATCC  3720
AAGAGCCCAC TGTCACCTTC TAGACCACAT GATAGGGCTA GACAGCTCAG TTCACCATGA  3780
TTCTCTTCTG TCACCTCTGC TGGCACACCA GTGGCAAGGC CCAGAATGGC GACCTCTCTT  3840
TAGCTCAATT TCTGCGCCTG AGGTGCTCAG ACTGCCCCCA AGATCAAATC TCTCCTGGCT  3900
GTAGTAACCC AGTGGAATGA ATTTGGACAT GCCCCAATGC TTCTATATGC TAAGTGAAAT  3960
CTGTGTCTGT AATTTGTTGG GGGGTGGATA GGGTGGGGTC TCCATCTACT TTTTGTCACC  4020
ATCATCTGAA ATGGCGAAAT ATGTAAATAA ATATATCAGC AAAGC
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Seq ID NO: 10 Protein sequence
Protein Accession #: NP_068830.1

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1          11         21         31         41         51
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MVRIYKDGKV LYTIRMTIDA GCSLHMLRFP MDSHSCPLSF SSFSYPENEM IYKWENFKLE   120
INEKNSWKLF QFDFTGVSNK TEIITTPVGD FMVMTIFFNV SRRFGYVAFQ NYVPSSVTTM   180
LSWVSFWIKT ESAPARTSLG ITSVLTMTTL GTFSRKNFPR VSYITALDFY IAICFVFCFC   240
ALLEFAVLNF LIYNQTKAHA SPKLRHPRIN SRAHARTRAR SRACARQHQE AFVCQIVTTE   300
GSDGEERPSC SAQQPPSPGS PEGPRSLCSK LACCEWCKRF KKYFCMVPDC EGSTWQQGRL   360
CIHVYRLDNY SRVVFPVTFF FFNVLYWLVC LNL
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Seq ID NO: 11 DNA sequence
Nucleic Acid Accession #: NM_001076.1
Coding sequence: 22..1614

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1          11         21         31         41         51
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CTCAGTTGTT ACTTTAGCTC TGGAAGCTGT GGAAAGGTGC TAGTGTGGCC CACAGAATAC   120
AGCCATTGGA TAAATATGAA GACAATCCTG GAAGAGCTTG TTCAGAGGGG TCATGAGGTG   180
ACTCTCTTGA CATCTTCGGC TTCTACTCTT GTCAATGCCA GTAAATCATC TGCTATTAAA   240
TTAGAAGTTT ATCCTACATC TTTAACTAAA AATGATTTGG AAGATTCTCT TCTGAAAATT   300
CTCGATAGAT GGATATATGG TGTTTCAAAA AATACATTTT GGTCATATTT TTCACAATTA   360
CAACAATTGT GTTGGGAATA TTATGACTAC AGTAACAAGC TCTGTAAAGA TGCAGTTTTG   420
AATAAGAAAC TTATGATGAA ACTACAAGAG TCAAAGTTTG ATGTCATTCT GGCAGATGCC   480
CTTAATCCCT GTGGTGAGCT ACTGGCTGAA CTATTTAACA TACCCTTTCT GTACAGTCTT   540
CGATTCTCTG TTGGCTACAC ATTTGAGAAG AATGGTGGAG GATTTCTGTT CCCTCCTTCC   600
TATGTACCTG TTGTTATGTC AGAATTAAGT GATCAAATGA TTTTCATGGA GAGGATAAAA   660
AATATGATAC ATATGCTTTA TTTTGACTTT TGGTTTCAAA TTTATGATCT GAAGAAGTGG   720
GACCAGTTTT ATAGTGAAGT TCTAGGAAGA CCCACTACAT TATTTGAGAC AATGGGGAAA   780
GCTGAAATGT GCCTCATTCG AACCTATTGG GATTTTGAAT TTCCTCGCCC ATTCTTACCA   840
AATGTTGATT TTGTTGGAGG ACTTCACTGT AAACCAGCCA AACCCCTGCC TAAGGAAATG   900
GAAGAGTTTG TGCAGAGCTC TGGAGAAAAT GGTATTGTGG TGTTTTCTCT GGGGTCGATG   960
ATCAGTAACA TGTCAGAAGA AAGTGCCAAC ATGATTGCAT CAGCCCTTGC CCAGATCCCA  1020
CAAAAGGTTC TATGGAGATT TGATGGCAAG AAGCCAAATA CATTAGGTTC CAATACTCGA  1080
CTGTACAAGT GGTTACCCCA GAATGACCTT CTTGGTCATC CCAAAACCAA AGCTTTTATA  1140
ACTCATGGTG GAACCAATGG CATCTATGAG GCGATCTACC ATGGGATCCC TATGGTGGGC  1200
ATTCCCTTGT TTGCGGATCA ACATGATAAC ATTGCTCACA TGAAAGCCAA GGGAGCAGCC  1260
CTCAGTGTGG ACATCAGGAC CATGTCAAGT AGAGATTTGC TCAATGCATT GAAGTCAGTC  1320
ATTAATGACC CTGTCTATAA AGAGAATGTC ATGAAATTAT CAAGAATTCA TCATGACCAA  1380
CCAATCAAGC CCCTGGATCG AGCAGTCTTC TGGATTGAGT TTGTCATGCG CCACAAAGGA  1440
GCCAACCACC TTCGAGTCGC AGCTCACAAC CTCACCTGGA TCCAGTACCA CTCTTTGGAT  1500
GTGATAGCAT TCCTGCTGGC CTGCGTGGCA ACTGTGATAT TTATCATCAC AAAATTTTGC  1560
CTGTTTTGTT TCCGAAAGCT TGCCAAAACA GGAAAGAAGA AGAAAAGAGA TTAGTTATAT  1620
CAAAAGCCTG AAGTGGAATG ACTGAAAGAT GGGACTCCTC CTTTATTTCA GCATGGAGGG  1680
TTTTAAATGG AGGATTTCCT TTTTCCTGTG ACAAAACATC TTTTCACAAC TTACCTTGTT  1740
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ATGATTTTTA AGCTATGAAA AATACAATGG GGGGAAGGAT AGCATTTGGA GATATACCTA  1860
ATGTTAAATG ACGAGTTACT GGATGCAGCA CGCAACATGG CACATGTGTA TACATATGTA  1920
CCTAACCCTT CGTTGTGCAC ATGTACCCTA AAACTTAAAG TATAATTTAA AAAAAGCAAA  1980
AAAAAAAAAT ACCAACTCTT TTTTTTAAAC CAGGAAGGAA AATGTGAACA TGGAAACAAC  2040
TTCTAGTATT GGATCTGAAA ATAAAGTGTC ATCCAAGCCA TAAAAAAAAA
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Seq ID NO: 12 Protein sequence
Protein Accession #: NP_001067.1

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1          11         21         31         41         51
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STLVNASKSS AIKLEVYPTS LTKNDLEDSL LKILDRWIYG VSKNTFWSYF SQLQELCWEY   120
YDYSNKLCKD AVLNKKLMMK LQESKFDVIL ADALNPCGEL LAELFNIPFL YSLRFSVGYT   180
FEKNGGGFLF PPSYVPVVMS ELSDQMIFME RIKNMIHMLY FDFWFQIYDL KKWDQFYSEV   240
LGRPTTLFET MGKAEMWLIR TYWDFEFPRP FLPNVDFVGG LHCKPAKPLP KEMEEFVQSS   300
GENGIVVFSL GSMISNMSEE SANMIASALA QIPQKVLWRF DGKKPNTLGS NTRLYKWLPQ   360
NDLLGHPKTK AFITHGGTNG IYEAIYHGIP MVGIPLFADQ HDNIAHMKAK GAALSVDIRT   420
MSSRDLLNAL KSVINDPVYK ENVMKLSRIH HDQPMKPLDR AVFWIEFVMR HKGAKHLRVA   480
AHNLTWIQYH SLDVIAFLLA CVATVIFIIT KFCLFCFRKL AKTGKKKKRD
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Seq ID NO: 13 DNA sequence
Nucleic Acid Accession #: NM_014109.1
Coding sequence: 651..1739

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GAGTTAGTAC TACATCCCCT GAAGAAACAT GTGCCCAGGT GATTCGTGAA GCTAAGAGAA   120
CAGCACCAAG TATAGTGTAT GTTCCTCATA TCCACGTGTG GTGGGAAATA GTTGGACCGA   180
CACTTAAAGC CACATTTACC ACATTATTAC AGAATATTCC TTCATTTGCT CCAGTTTTAC   240
TACTTGCAAC TTCTGACAAA CCCCATTCCG CTTTGCCAGA AGAGGTGCAA GAATTGTTTA   300
TCCGTGATTA TGGAGAGATT TTTAATGTCC AGTTACCGGA TAAAGAAGAA CGGACAAAAT   360
TTTTTGAAGA TTTAATTCTA AAACAAGCTG CTAAGCCTCC TATATCAAAA AAGAAAGCAG   420
TTTTGCAGGC TTTGGAGGTA CTCCCAGTAG CACCACCACC TGAGCCAAGA TCACTGACAG   480
CAGAAGAAGT GAAACGACTA GAAGAACAAG AAGAAGATAC ATTTAGAGAA CTGAGGATTT   540
TCTTAAGAAA TGTTACACAT AGGCTTGCTA TTGACAAGCG ATTCCGAGTG TTTACTAAGC   600
CTGTTGACCC TGATGAGGTT CCTGATTATG TCACTGTAAT AAAGCAACCA ATGGACCTTT   660
CATCTGTAAT CAGTAAAATT GATCTACACA AGTATCTGAC TGTGAAAGAC TATTTGAGAG   720
ATATTGATCT AATCTGTAGT AATGCCTTAG AATACAATCC AGATAGAGAT CCTGGAGATC   780
GTCTTATTAG GCATAGAGCC TGTGCTTTAA GAGATACTGC CTATGCCATA ATTAAAGAAG   840
AACTTGATGA AGACTTTGAG CAGCTCTGTG AAGAAATTCA GGAATCTAGA AAGAAAAGAG   900
GTTGTAGCTC CTCCAAATAT GCCCCGTCTT ACTACCATGT GATGCCAAAG CAAAATTCCA   960
CTCTTGTTGG TGATAAAAGA TCAGACCCAG AGCAGAATGA AAAGCTAAAG ACACCGAGTA  1020
CTCCTGTGGC TTGCAGCACT CCTGCTCAGT TGAAGAGGAA AATTCGCAAA AAGTCAAACT  1080
GGTACTTAGG CACCATAAAA AAGCGAAGGA AGATTTCACA GGCAAAGGAT GATAGCCAGA  1140
ATGCCATAGA TCACAAAATT GAGAGTGATA CAGAGGAAAC TCAAGACACA AGTGTAGATC  1200
ATAATGAGAC CGGAAACACA GGAGAGTCTT CGGTGGAAGA AAATGAAAAA CAGCAAAATG  1260
CCTCTGAAAG CAAACTGGAA TTGAGAAATA ATTCAAATAC TTGTAATATA GAGAATGAGC  1320
TTGAAGACTC TAGGAAGACT ACAGCATGTA CAGAATTGAG AGACAAGATT GCTTGTAATG  1380
GAGATGCTTC TAGCTCTCAG ATAATACATA TTTCTGATGA AAATGAAGGA AAAGAAATGT  1440
GTGTTCTGCG AATGACTCGA GCTAGACGTT CCCAGGTAGA ACAGCAGCAG CTCATCACTG  1500
TTGAAAAGGC TTTGGCAATT CTTTCTCAGC CTACACCCTC ACTTGTTGTG GATCATGAGC  1560
GATTAAAAAA TCTTTTGAAG ACTGTTGTTA AAAAAAGTCA AAACTACAAC ATATTTCAGT  1620
TGGAAAATTT GTATGCAGTA ATCAGCCAAT GTATTTATCG GCATCGCAAG GACCATGATA  1680
AAACATCACT TATTCAGAAA ATGGAGCAAG AGGTAGAAAA CTTCAGTTGT TCCAGATGAT  1740
GATGTCATGG TATCGAGTAT TCTTTATATT CAGTTCCTAT TTAAGTCATT TTTGTCATGT  1800
CCGCCTAATT GATGTAGTAT GAAACCCTGC ATCTTTAAGG AAAAGATTAA AATAGTAAAA  1860
TAAAAGTATT TAAACTTTCC TGATATTTAT GTACATATTA AGATAAATGT CATGTGTAAG  1920
ATAACTGATA AATA
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Seq ID NO: 14 Protein sequence
Protein Accession #: NP_054828.1

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1          11         21         31         41         51
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MDLSSVISKI DLHKYLTVKD YLRDIDLICS NALEYNPDRD PGDRLIRHRA CALRDTAYAI    60
IKEELDEDFE QLCEEIQESR KKRGCSSSKY APSYYHVMPK QNSTLVGDKR SDPEQNEKLK   120
TPSTPVACST PAQLKRKIRK KSNWYLGTIK KRRKISQAKD DSQNAIDHKI ESDTEETQDT   180
SVDHNETGNT GESSVEENEK QQNASESKLE LRNNSNTCNI ENELEDSRKT TACTELRDKI   240
ACNGDASSSQ IIHISDENEG KEMCVLRMTR ARRSQVEQQQ LITVEKALAI LSQPTPSLVV   300
DHERLKNLLK TVVKKSQNYN IFQLENLYAV ISQCIYRHRK DHDKTSLIQK MEQEVENFSC   360
SR
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Seq ID NO: 15 DNA sequence
Nucleic Acid Accession #: AK001536

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1          11         21         31         41         51
|          |          |          |          |          |
TATATGTGAC CTTTTTAAAA AATGAGCTGT AAGCAGTCTC CCAGACAGTA GCTCAGCCTC    60
CAGAACTCTC TTTCTGCATA GTTGAAGACC CCTCTTCACA CAAGATGGTA GCAACAAATC   120
ATAGGTGCAA TTGCACCAAA TTCACAGAAG ATCAATTGAA AATCCTCATC AATACCTTCA   180
CTCAAAAACC TTACCCAGGT TATGCTACCA AACAAAAACT TGCTTTAGCA ATCAATGCAG   240
AAGAGTCCAG AATCCAGATT TGGTTTCAGA ATCAAAGAGC TAGGCATGGA TTCCAGAAAA   300
CACCAGAACC TGACTTTAGA TTTAAGCCAC AGCCATGGAC AAGATTAACC TGGTGTGGAG   360
TTTCAAAATA GAGAAGCCAG ATGGTGTTGT ACCACCTATA GCACCTTTCA ATTACACACA   420
ATCATCCATG CATTTATGAA AAACCCATAC CCTGGGATTG ATTCCGGAGA ACAACTTGCT   480
GAAGAAATTG GTGCTTCAGA GTCAAGAGTC CAAATTTGGT TCCAAAATCA AAGATCTAGA   540
TTTCATCTCC AGAGAAAAAG AGAACCTGTT ATGTCCTTAG AATGAGAAGA CCAGAGAAGA   600
CCAGGGGCAA GGTTTCTGAG GGACTTCAAG GTACAGAAGA TACACAAAGT GGCACCAGCC   660
TCACTAGCAC TCTCATTTCT CAAGAGCCAG AACATGGTGA ATACAGTCAA GTTCAGTGTA   720
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TTTGATAATA TCAATTTGGG CCCCAAATCT CTCTCACAGT CTTCCTGGGA GTCTATTCTT    780
CTTCCAAAAG TGCAAGCTAA GCCTTCTGAA GATGGTAAAG AACTTGGCCG GGTGTGGTGG    840
CTCATGCCTG TAATCCCAGC ACTTTAGGAG GCTGAGGCTG GAAGATTGCT TGAGCCTAGG    900
AGTTTGAAAC CAGTCTGAGC AACATAGTAA GACCCTGTCT CTATTCTAAA AAACAAAATA    960
AGTAAAAAGG ACTGTAGGAG GCCAAGACAG GTACAGGAGG CACCACACTA CCCTGTTGAC   1020
ACAGCCTGGA TCCAGAGTTC AGCAGACCTT GAGACAATGA AAACAAACTT AGTAATAATC   1080
ATTTTTCAAT CATTGCAGTA ATTATTGATT TGGACAAAAA TCAATTGACG TCAAAACCTT   1140
AAAGTGACGT TTCTCTGCCT ATGGAGTGGT CATTCTTTTA TTCCTTTAGT TTCATAATAA   1200
ATTTTCTTTT ACTTAAAAAA ACTTATAGTT TGATGAAGAG TGAGATATAT ACCTCATCTC   1260
AAAGAATCTT CACACACACA CTTATTAATT ACAAAAGGAA AATCAGTAAT TTTGCAGTGG   1320
AGACATATGG CCAACTCCAC CTTACCCAAG TGGCTGAAAG TCACTGCACC AGTAATGGCA   1380
CAAACCAATG TGAGATGATT CCTGATATGA TACACTAAAA AGGGCACTGT CTCTTCTGCA   1440
TGTTGCAGAC AAAAAGTGGG TAAGCTGACA CTGAAACTAA TAATTAGGCA ATGTCAAGCA   1500
AATACAAATT CAAGTTGACA GTCTGCAAAG TAACATCCAT GTACTCTTCA ACAATGGATC   1560
GACCCTAGCT ACTCAGGAGG CTGAGGTGGA ATAATTGTTT GAGGCCAGGA GTTCCAGATC   1620
AGCCTGGGCA ACATCATGCG ACCCCATCTC TAAAAACATC TTTTTAAAAA TGAGCCAGGT   1680
GTGGTAGCAT GCACCCGTAG TCTCAGCTAC TCAGGAGCCT GAGGCAGGAG GATGGTTTCA   1740
ACATAGGAGA TCGAGGCTGC TGTGAGCTAT GATCGTGCTA CTGCACTCCA GCCTGGGTGA   1800
CACAGCAAGT TCCTGTTTCC AAACAACAAC AAGAAAACAA AACAAAACAA AACAAAAAAT   1860
AGATAGAATA GTGACAATAA AAATGGAGAA AAAGTAGGCT GACTCAGGAA ATGCTTAGAA   1920
AGTACAGCCA TACCTCAAAG ATATTGTAGA TTTGATTCGA GACCACCACA ATAAAGCAGA   1980
TATTGCTACA AAGTGAGTCA CACAAATTGT TTTGTTTCCT TGTGAATATG AAGTTATATT   2040
GGCTGGGTGT GATGGCTCAT GCCTATAATC CCAGTACTTT AGGAGACGGA GGCGGGAGGG   2100
TCACTTGAGC CCAGGAATTG TGAGATCAAC CTGGGCATAT AGGGAGATCC TGTCTCTATT   2160
TAAAAAAAGA AGCTATGTTT ACACTACACT ATAGTCTATT TAAAGTGTGA AATGGCGTTA   2220
TGTCCTTAAT TTTAAAACTC TTGATGCTGG CTGGGTTCGG TGGCTCATAC CTGTAATCCC   2280
ATCACTTTGG GAGGCCAAGA CAGGTTGATT ACTTGAATTC AGGAGTTCAA GACCAGCCTG   2340
GACAACATGG CAAAACACGT CTTTAAAAAA AGAAAAGAAA AAAGAAAAAC AGAAAGAAAA   2400
AGAAGAAAAA CTACTTGCTG CCCTTACTTG AAGCTCAATT ATTTAAAAC
```

Seq ID NO: 16 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
CTTTTTTTTT TTTTTTTTTT TAGTAGAGAC AGGGTTTCAC CATGTTAGCC AGGATGGTCT     60
CGATCTCCTG ACCTCATGAT CTTCCTGCTT TGGCCTCCCA AAGTGCTGCG ATTACAGGCG    120
TGAGCCACTG CACCCAGCCC AGAGTTTTTT TTAACAAGGT TCTTCTCAGC AATTCTAGTA    180
TCCAGATATA GGCCCATCAT AGACATCACA CAAGCGTGTA CTTCATAATC CTGGTGAATA    240
CAGAAGTTTC CTGGACTCCT TGATGAGCTA CTGCTTTCGC TCCTATATCA GTGTTTTCAG    300
CTGATGTCAT TTGTGATTGT GTTTCTGACT TTCTGTAGGC AGAAAAAAAC TTTCATTTTT    360
TTTTTGCTTA CATGCACATA AATGTAAGCG CTAATTCTTA TATTAAACTG TTTATTTCTA    420
TAATACTTAA TTGGCTGTTT TCCTGGCTGA ACCAAACCAA GAGCATAAGG AATGATAACC    480
TTCAAAACTG ATTAAATTAG AGATCAATAA ATGGAGCTGT TTTAATTCTA TTATTCTTCT    540
TTCATAGATT AAATAGAAAA TTTTT
```

Seq ID NO: 17 DNA sequence
Nucleic Acid Accession #: CAT cluster

```
1          11         21         31         41         51
|          |          |          |          |          |
GGCACGAGAA GACGCCACAT CCCCTATTAT AGAAGAGCTA ATAAATTTCC ATGATCACAC     60
ACTAATAATT GTTTTCCTAA TTAGCTCCTT AGTCCTCTAT ATCATCTCGC TAATATTAAC    120
AACAAAACTA ACACATACAA GCACAATAGA TGCACAAGAA GTTGAAACCA TTTGAACTAT    180
TCTACCAGCT GTAATCCTTA TCATAATTGC TCTCCCCTCT CTACGCATTC TATATATAAT    240
AGACGAAATC AACAACCCCG TATTAACCGT TAAAACCATA GGGCACCAAT GATACTGAAG    300
CTACGAATAT ACTGACTATG AAGACCTATG CTTTGATTCA TATATAATCC CAACAAACGA    360
CCTAAAACCT GGTGAACTAC GACTGCTAGA AGTTGATAAC CGAGTCGTTC TGCCAATAGA    420
ACTTCCAATC CGTATATTAA TTTCATCTGA AGACGTCCTC CACTCATGAG CAGTCCCCTC    480
CCTAGGACTT AAAACTGATG CCATCCCAGG CCGACTAAAT CCAGCACAGT ACATCAACCG    540
ACCAGGGTTA TTCTATGGCC AATGTCTGAA TTTGTGGTCT TACCATAGCT TTTTGCCATT    600
GTCCTAGAAT GGGTCCCTAA AATATTTCGG NACTGGTCTG
```

Seq ID NO: 18 DNA sequence
Nucleic Acid Accession #: CAT cluster

```
1          11         21         31         41         51
|          |          |          |          |          |
GTGTACATCA GAGCAAAAAT ACAGAGTATT TATTCATTTC TTCCCACTAG AGGGACACAC     60
TGTTCTTGGA CAGACAAATG AATCATCAGT TGTCAGGAGT TGCCTTTGGA GAATGATCAA    120
TGAACTCCTT TTCAGGGGTT GGAAATTGAT ACCAGGGTCC ATCACCTCGG GCACGCATCA    180
GCCTTCGAAC TTCCTGCTCC TTTAACCGTA ACTCAGCCTT TTCAGATTCA ATCTGGAGGA    240
TAGCCAGGGT TTTCTCGTAG TTCTTTTCAG GGCCATCATA GAAATTCCGG GCGATCCATC    300
TTGATATCGG ATGCTTGTAA TACTCCCAGT GTTCAGGGAT GTAGCCTTCT GGGATTTCTG    360
CAAGCTCGGC TTCACCAATA AATATGTTCA CCAGTGTTAT GCCAATTATA ACTGGGATCC    420
CAGTCAACAT AAGGTAGAAT TTCATTAACC TCAAGAAGCG AGCGTCATAG TATAAAGAAG    480
GCTTGACGAC AAACAGTCTC TTGCCATGTC CCCACTGTGC CGCACAGGAG CGACAGTCTT    540
CGGAAANTCC GCGTGAGAAA ACTTCCGACT CCGAGTCTAG GACCAGCGCG GCGGCAAGAC    600
CACGCTGTCA GCGCGGAGAC CGAANCCGCT GCAGCAGCTC ATGGCCGCCA TGG
```

Seq ID NO: 19 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
TAGTCCAGTN AATTACTTTA ATTTCGCTTT TCCATAATAC TGGTATTCCA TAGAAGAAAA     60
TCTTTTATTA ATATTCTATA CTACTACATC CGACACCAGA TGACTAAAGT TTGCAATGGT    120
CCAAAATTCT GTAAACCCAT TAAATGCAAT TCATACTTTA TTTTGGCAGT ATTCATTTCA    180
TCATTACTTT ATTTGGATGC TAACGCAAGT ACTTCTAAGG AAAAGCTGTC ATATAATTAC    240
TTTAGTCAAG CATTCAGTAG AGGCAATAAT CAAACCTCTA TCCCAACATT TTACACTTGT    300
AACAGAATGA AGGATGAGGT ACAACATACA TTTTTGGCAA TTTACTATTA AGGGCCATAA    360
TCATTTTAGG GGCGCTTAGG GCCCATATAT ATATATATAT ATTTTTGGAC A
```

Seq ID NO: 20 DNA sequence
Nucleic Acid Accession #: U92072
Coding sequence: 351..3701

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1          11         21         31         41         51
|          |          |          |          |          |
GCCGGGCGGC TGCGCTGAGC AGAGGCCGAG CCCGGGACGC GCCGAGGGAC TGCGGGGCTG     60
CGGGTCATGG ATGCGGCGGC AGCGGCGCGG GACGGCGGGA GCCCGGCCGC GACCAGGTGA    120
GGAGGCGGCG TCCGGCGCCA CTGCAGCCGC AGCGGCCTCG GAGGAAGAGG GCTCGCCGCC    180
GCGCGCCCGC CCGCCGTCGC TGCCCTTCCT GTTGGGATTA TCTTCTGCTC CCCGCTGCTT    240
CTTCGCTCCC CGCGGTCGAA GCCGCCTCTA GGCTTCAGCG GCTCGGACTC CTTGGCAGCC    300
GGTGCCTCTG CTACCTGGGC CTCGTAGCTG GGAGACCCTT GGGCGAGACC ATGAGGAAAT    360
TCAACATCAG GAAGGTGCTG GACGGCCTGA CCGCAGGCTC GTCCTCGGCC TCGCAACAGC    420
AGCAACAGCA GCAGCACCCG CCTGGGAACC GGGAGCCCGA GATCCAGGAG ACGCTCCAGT    480
CCGAGCACTT CCAACTCTGC AAGACTGTTC GCCATGGATT TCCCTATCAG CCCTCAGCCC    540
TGGCCTTTGA TCCCGTTCAG AAGATCCTGG CGGTAGGAAC CCAGACTGGT GCTTTAAGGC    600
TCTTTGGTCG TCCAGGGGTG GAATGTTATT GCCAGCACGA CAGCGGAGCG GCAGTGATTC    660
AACTCCAGTT CCTGATTAAT GAGGGAGCCC TTGTGAGTGC CTTGGCTGAT GACACCTTAC    720
ACTTGTGGAA TTTACGTCAG AAAAGGCCTG CTGTGCTACA TTCACTCAAA TTTTGCAGAG    780
AAAGGGTTAC ATTTTGCCAT CTGCCTTTCC AGAGTAAGTG GCTCTATGTG GGCACGGAAC    840
GAGGTAATAT ACATATTGTC AATGTGGAGT CCTTCACACT CTCAGGCTAC GTCATTATGT    900
GGAATAAAGC CATCGAACTG TCATCTAAAT CTCACCCAGG ACCTGTTGTC CATATAAGTG    960
ATAATCCCAT GGACGAGGGG AAGCTTCTGA TTGGCTTTGA ATCTGGAACA GTAGTCTTAT   1020
GGGACCTTAA GTCAAAGAAG GCTGACTACA GATACACTTA CGACGAGGCT ATTCACTCTG   1080
TGGCTTGGCA TCATGAAGGA AAACAGTTTA TTTGCAGTCA TTCTGATGGT ACATTGACCA   1140
TATGGAATGT GAGGTCCCCT ACTAAACCTG TACAGACCAT CACTCCTCAC GGAAAACAGT   1200
TAAAGGATGG GAAGAAACCC GAGCCGTGCA AGCCTATCCT CAAGGTGGAG TTCAAGACAA   1260
CAAGATCGGG GGAACCTTTT ATTATTTTGT CGGGAGGCTT ATCATATGAT ACCGTGGGAA   1320
GAAGACCTTG CTTAACAGTG ATGCATGGGA AAAGCACGGC AGTGCTGGAA ATGGACTATT   1380
CAATTGTCGA CTTTCTCACA CTCTGTGAAA CGCCATATCC AAATGATTTT CAGGAGCCGT   1440
ATGCTGTGGT TGTTCTCCTG GAGAAGGATT TAGTGCTGAT AGACCTGGCA CAGAATGGAT   1500
ACCCTATATT TGAGAATCCC TACCCTTTGA GTATACACGA GTCCCCTGTT ACATGTTGTG   1560
AATATTTTGC TGATTGTCCT GTGGACCTTA TTCCTGCACT TTATTCTGTT GGAGCTAGAC   1620
AGAAACGTCA AGGTTACAGC AAAAAGGAAT GGCCCATCAA TGGTGGTAAT TGGGGCTTGG   1680
GTGCTCAAAG TTACCCAGAA ATAATTATTA CAGGGCATGC TGATGGCTCA ATTAAATTCT   1740
GGGATGCTTC TGCAATAACT CTACAAGTAC TGTATAAATT AAAAACATCT AAAGTATTTG   1800
AAAAGTCAAG AAATAAAGAT GACAGACAGA ACACCGACAT TGTAGATGAA GATCCATATG   1860
CCATTCAGAT CATCTCCTGG TGCCCAGAGA GCAGAATGCT GTGCATAGCC GGAGTGTCGG   1920
CTCATGTCAT CATTTATAGA TTCAGCAAGC AGGAAGTGGT TACAGAAGTC ATCCCGATGC   1980
TTGAAGTCCG ACTGTTATAT GAAATAAATG ATGTGGAAAC GCCGGAGGGT GAGCAGCCAC   2040
CCCCTTTGTC CACTCCCGTG GGCAGCTCCA CCTCTCAGCC CATCCCCCCT CAGTCTCATC   2100
CGTCTACCAG CAGCAGCTCA TCGGACGGGC TTCGAGATAA TGTACCGTGT TTAAAAGTTA   2160
AAAACTCACC ACTTAAACAG TCTCCCGGCT ATCAAACAGA GCTAGTCATC CAGTTGGTGT   2220
GGGTGGGTGG AGAACCCCCG CAGCAGATCA CCAGCCTAGC ACTCAACTCT TCCTACGGAT   2280
TGGTGGTTTT CGGCAACTCC AATGGCATTG CAATGGTTGA CTACCTCCAG AAAGCAGTGC   2340
TGCTCAACCT CAGCACCATT GAACTATACG GCTCAAATGA TCCTTATCGG AGAGAACCGA   2400
GGTCGCCCCG CAAATCTCGA CAGCCTTCAG GAGCGGGCCT GTGTGATATT ACCGAAGGAA   2460
CTGTCGTCCC AGAGGATCGC TGCAAATCTC CGACTTCCGC AAAGATGTCA AGGAAATTAA   2520
GCTTGCCAAC TGATCTAAAG CCTGATTTAG ATGTGAAAGA CAATTCCTTC AGCAGATCTC   2580
GGAGTTCAAG TGTGACCAGC ATTGACAAAG AGTCCCGGGA AGCCATTTCT GCTCTTCATT   2640
TCTGTGAGAC TTTCACAAGG AAGGCAGACT CCTCCCCCTC CCCGTGCCTG TGGGTGGGAA   2700
CCACAGTGGG AACTGCCTTT GTCATCACGC TGAATCTCCC CCTGGGGCCT GAGCAGAGAC   2760
TGCTTCAGCC AGTGATTGTG TCTCCAAGCG GTACTATATT GAGGTTAAAA GGTGCGATCT   2820
TGAGAATGGC ATTTCTGGAT GCCGCGGGCT GCTTAATGCC ACCTGCATAC GAACCCTGGA   2880
CAGAGCACAA CGTTCCTGAA GAAAAAGACG AAAAGGAGAA ATTGAAAAAG CGGCGACCTG   2940
TCTCAGTGTC CCCCTCCTCT TCTCAGGAAA TTAGTGAAAA CCAGTACGCA GTGATATGTT   3000
CTGAAAAGCA AGCAAAGGTC ATCTCACTGC CAACCCAGAA CTGTGCATAC AAGCAGAACA   3060
TCACTGAGAC GTCCTTCGTG CTCCGTGGAG ACATTGTCGC CCTGAGTAAC AGTGTCTGCC   3120
TCGCCTGCTT CTGTGCCAAC GGCCACATTA TGACTTTCAG TTTGCCGAGC TTGAGGCCTC   3180
TGCTGGATGT CTACTACCTG CCCCTTACCA ACATGCGGAT AGCCAGGACA TTCTGCTTCG   3240
CCAACAGTGG GCAAGCCTTA TACCTTGTTT CACCTACCGA AATCCAGAGA CTCACCTACA   3300
GTCAGGAGAC GTGTGAAAAC CTTCAGGAGA TGCTTGGTGA GCTCTTCACG CCTGTAGAAA   3360
CACCAGAAGC ACCAAACAGA GGGTTCTTCA AAGGCTTATT TGGAGGTGGT GCACAATCTC   3420
TTGATAGAGA AGAACTGTTT GGAGAGTCAT CCTCGGGAAA GGCGTCAAGG AGCCTTGCAC   3480
AGCACATCCC GGGTCCTGGC GGGATCGAAG GTGTGAAGGG AGCCGCGTCG GGAGTGGTGG   3540
GAGAACTGGC CCGAGCCAGG CTGGCCCTCG ACGAAAGAGG ACAGAAGCTC AGCGACTTGG   3600
AAGAGAGGAC TGCAGCCATG ATGTCCAGTG CAGACTCGTT TTCCAAACAT GCTCATGAGA   3660
TGATGCTGAA ATACAAAGAT AAGAAGTGGT ACCAGTTCTG ACAAGTAGCA CTCAGTAAGT   3720
CCAGCTTCAA CCAGAAGGAA AAAGACGTTT CCTTGTTGAG GTCACTGATG TATTTGGGAA   3780
AGATAACATA AAAGGGATGC ACACTGCTGA CAGCGTCTTT CCCAGCACAA TCATGCACTT
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Seq ID NO: 21 Protein sequence
Protein Accession #: AAD04756


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1          11         21         31         41         51
|          |          |          |          |          |
MRKFNIRKVL DGLTAGSSSA SQQQQQQQHP PGNREPEIQE TLQSEHFQLC KTVRHGFPYQ   60
PSALAFDPVQ KILAVGTQTG ALRLFGRPGV ECYCQHDSGA AVIQLQFLIN EGALVSALAD  120
DTLHLWNLRQ KRPAVLHSLK FCRERVTFCH LPFQSKWLYV GTERGNIHIV NVESFTLSGY  180
VIMWNKAIEL SSKSHPGPVV HISDNPMDEG KLLIGFESGT VVLWDLKSKK ADYRYTYDEA  240
IHSVAWHHEG KQFICSHSDG TLTIWNVRSP TKPVQTITPH GKQLKDGKKP EPCKPILKVE  300
FKTTRSGEPF IILSGGLSYD TVGRRPCLTV MHGKSTAVLE MDYSIVDFLT LCETPYPNDF  360
QEPYAVVVLL EKDLVLIDLA QNGYPIFENP YPLSIHESPV TCCEYFADCP VDLIPALYSV  420
GARQKRQGYS KKEWPINGGN WGLGAQSYPE IIITGHADGS IKFWDASAIT LQVLYKLKTS  480
KVFEKSRNKD DRQNTDIVDE DPYAIQIISW CPESRMLCIA GVSAHVIIYR FSKQEVVTEV  540
IPMLEVRLLY EINDVETPEG EQPPPLSTPV GSSTSQPIPP QSHPSTSSSS SDGLRDNVPC  600
LKVKNSPLKQ SPGYQTELVI QLVWVGGEPP QQITSLALNS SYGLVVFGNS NGIAMVDYLQ  660
KAVLLNLSTI ELYGSNDPYR REPRSPRKSR QPSGAGLCDI TEGTVVPEDR CKSPTSAKMS  720
RKLSLPTDLK PDLDVKDNSF SRSRSSSVTS IDKESREAIS ALHFCETFTR KADSSPSPCL  780
WVGTTVGTAF VITLNLPLGP EQRLLQPVIV SPSGTILRLK GAILRMAFLD AAGCLMPPAY  840
EPWTEHNVPE EKDEKEKLKK RRPVSVSPSS SQEISENQYA VICSEKQAKV ISLPTQNCAY  900
KQNITETSFV LRGDIVALSN SVCLACFCAN GHIMTFSLPS LRPLLDVYYL PLTNMRIART  960
FCFANSGQAL YLVSPTEIQR LTYSQETCEN LQEMLGELFT PVETPEAPNR GFFKGLFGGG 1020
AQSLDREELF GESSSGKASR SLAQHIPGPG GIEGVKGAAS GVVGELARAR LALDERGQKL 1080
SDLEERTAAM MSSADSFSKH AHEMMLKYKD KKWYQF
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Seq ID NO: 22 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
TCCCATCGGG TGAACCGTGG TCTTGTTCCG TCCGCCCACA ATCGCTCTCC AGCTTTGACG   60
GCCCCGGCAA AGCCTGGCTC GTTCACAGCT CTCTCGCACC TCCTGGAGCT TCAGCTTCTT  120
CCGTTGCAGA GAAGCTTTAT GGGCCAATTC GTTCGGCATC CCGGGGGCAG GTGCGCGGTG  180
CGCGGGGAAG AAGAGGATTT GACTGCGGTT CTCCACCCCC GGCGCCCAAC CTCCACCCCG  240
GTGCGCGCGC TCTTCCAGGC TCCTGCTGGT CCCACTTGCC AGGAGTTAGG TCTCAGGTCA  300
GCCTGAGCTC CTGAGACGCC CAGGCCCGGA AAGACACGTA GGGGAAACCA TCTGCTCACT  360
TCTGTCCTGT CCGGAAGGGA TCCCTTTCTG ACGGGAAAGA AAGGCGCTAA ACAAGCACTG  420
GCCTTGAGAT AAGCAATGCT GAAGCACTTG CAGCTCACCT ATTACCATAA ACTGACTGAG  480
CCCTCCCTAC ACAAGCCGTA ACTACTGCTT TGATTGGACA AGAGACTGAT TTCAGTAGTT  540
TTCTCTTGAT AAGAGACCAC TGGCCGTGGG CGGGTTCTGG ACAGTTTACA GAAGCTATGC  600
ACTTGATTGC CTTTGTGTCC CTGCTTCACC TTTTGAAGCA TAGGGCCTAA TTATAATGTA  660
TTTAAATGTT GTCTCCACCC CAAAGTGAAC ATGGGTTGCA TGTAACAGGC ATGTTTACTC  720
AGCATGCATG CAGCAGGATC CCTTCACAAA TATTCAGAGC TCCCCCTATT CCCTGTTGAA  780
TATGTATATG TGGCCAGCCA GATCAACGTA AATCACTATT CGCCCTCCCC TCCCTGGAAA  840
CCTACTTTTC GGGTTTCAGC AGGAAGCTAT GCCTCCCAGG CTTGTCGAAG AGGGCCCATT  900
TTCGGGCTTG ATAACCCCTT TATAAAAAAA TAAAATCTCC TTTCTAAATT TAAAATACAA  960
CCACACCACC GGCCCGCAAC TATTGGGGGG GAAAAAGAAT GAAGACACAC GGTACATAGT 1020
TTCATGCACA TTGTTAAGGA GACAGGTGCC CCCAAGCAGG CGGACATCAC GCAGTACGCA 1080
GCTTGAGCAT GCCGAAGACG CGAGCGACTC ATAGAACACG ACGACGCTCG CAAGGCACTA 1140
AGCATAGCTA CTACCACTCG TCGAAGAGTC ATACACAGAT TTCTATTGGC GA
```

Seq ID NO: 23 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
CTATGAATCT CGGAAATTAC TCAAACCATC AGCCTCTGCA AGAAGCAAAG TGGACGGCCG   60
GGCGCGGTGG CTCACTCCTG GAATCCCAGC ACTTTGGGAG CCCGAGGTGG CGGGATCACG  120
AGGTCAGGAG ATCGAGACTG TTCTGGCTAA ACCAGTGAAA CCCCCTCTCT ACTAAAAAAA  180
TAAGAAAAGC GAAGTGCATC TCCCATAAAC GAGGTACTGC AGGAAGAAAG CAGAAAATGA  240
GACCCGAGTA CACACATGCA CGCGGGCGCC GCACACACAC ACCAGAAGAA ATGAACCAAG  300
AGGAAAGGAA ACATTTTCAA ATAAGCATTT GGAGATGGGA AAAACACCTT GAAACAGAAA  360
TTCATAAAGT ACAGAATTTT TTTTTAAGTT AAAAAAGGAA CAATAATAGA CAGAAAATGA  420
ATGAAAAATT AAATGTCATA TCAGAAGTGA AGATAAATTA AAAGTGGTCA AAGGAGAAGA  480
GATCTAAATG CAAACTTAAG AAGGGGCAAT TTTTTTTTTT TTTTTTTTTG AGACGCAGCC  540
TCACTCTGTC GC
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Seq ID NO: 24 DNA sequence
Nucleic Acid Accession #: NM_000044.1
Coding sequence: 1115..3874

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1          11         21         31         41         51
|          |          |          |          |          |
CGAGATCCCG GGGAGCCAGC TTGCTGGGAG AGCGGGACGG TCCGGAGCAA GCCCACAGGC   60
AGAGGAGGCG ACAGAGGGAA AAAGGGCCGA GCTAGCCGCT CCAGTGCTGT ACAGGAGCCG  120
AAGGGACGCA CCACGCCAGC CCCAGCCCGG CTCCAGCGAC AGCCAACGCC TCTTGCAGCG  180
CGGCGGCTTC GAAGCCGCCG CCCGGAGCTG CCCTTTCCTC TTCGGTGAAG TTTTTAAAAG  240
CTGCTAAAGA CTCGGAGGAA GCAAGGAAAG TGCCTGGTAG GACTGACGGC TGCCTTTGTC  300
CTCCTCCTCT CCACCCCGCC TCCCCCCACC CTGCCTTCCC CCCCTCCCCC GTCTTCTCTC  360
CCGCAGCTGC CTCAGTCGGC TACTCTCAGC CAACCCCCCT CACCACCCTT CTCCCCACCC  420
GCCCCCCCGC CCCCGTCGGC CCAGCGCTGC CAGCCCGAGT TTGCAGAGAG GTAACTCCCT  480
TTGGCTGCGA GCGGGCGAGC TAGCTGCACA TTGCAAAGAA GGCTCTTAGG AGCCAGGCGA  540
CTGGGGAGCG GCTTCAGCAC TGCAGCCACG ACCCGCCTGG TTAGAATTCC GGCGGAGAGA  600
ACCCTCTGTT TTCCCCCACT CTCTCTCCAC CTCCTCCTGC CTTCCCCACC CCGAGTGCGG  660
AGCAGAGATC AAAAGATGAA AAGGCAGTCA GGTCTTCAGT AGCCAAAAAA CAAAACAAAC  720
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AAAAACAAAA AAGCCGAAAT AAAAGAAAAA GATAATAACT CAGTTCTTAT TTGCACCTAC    780
TTCAGTGGAC ACTGAATTTG GAAGGTGGAG GATTTTGTTT TTTTCTTTTA AGATCTGGGC    840
ATCTTTTGAA TCTACCCTTC AAGTATTAAG AGACAGACTG TGAGCCTAGC AGGGCAGATC    900
TTGTCCACCG TGTGTCTTCT TCTGCACGAG ACTTTGAGGC TGTCAGAGCG CTTTTTGCGT    960
GGTTGCTCCC GCAAGTTTCC TTCTCTGGAG CTTCCCGCAG GTGGGCAGCT AGCTGCAGCG   1020
ACTACCGCAT CATCACAGCC TGTTGAACTC TTCTGAGCAA GAGAAGGGGA GGCGGGGTAA   1080
GGGAAGTAGG TGGAAGATTC AGCCAAGCTC AAGGATGGAA GTGCAGTTAG GGCTGGGAAG   1140
GGTCTACCCT CGGCCGCCGT CCAAGACCTA CCGAGGAGCT TTCCAGAATC TGTTCCAGAG   1200
CGTGCGCGAA GTGATCCAGA ACCCGGGCCC CAGGCACCCA GAGGCCGCGA GCGCAGCACC   1260
TCCCGGCGCC AGTTTGCTGC TGCTGCAGCA GCAGCAGCAG CAGCAGCAGC AGCAGCAGCA   1320
GCAGCAGCAG CAGCAGCAGC AGCAGCAAGA GACTAGCCCC AGGCAGCAGC AGCAGCAGCA   1380
GGGTGAGGAT GGTTCTCCCC AAGCCCATCG TAGAGGCCCC ACAGGCTACC TGGTCCTGGA   1440
TGAGGAACAG CAACCTTCAC AGCCGCAGTC GGCCCTGGAG TGCCACCCCG AGAGAGGTTG   1500
CGTCCCAGAG CCTGGAGCCG CCGTGGCCGC CAGCAAGGGG CTGCCGCAGC AGCTGCCAGC   1560
ACCTCCGGAC GAGGATGACT CAGCTGCCCC ATCCACGTTG TCCCTGCTGG GCCCCACTTT   1620
CCCCGGCTTA AGCAGCTGCT CCGCTGACCT TAAAGACATC CTGAGCGAGG CCAGCACCAT   1680
GCAACTCCTT CAGCAACAGC AGCAGGAAGC AGTATCCGAA GGCAGCAGCA GCGGGAGAGC   1740
GAGGGAGGCC TCGGGGGCTC CCACTTCCTC CAAGCACAAT TACTTAGGGG GCACTTCGAC   1800
CATTTCTGAC AACGCCAAGG AGTTGTGTAA GGCAGTGTCG GTGTCCATGG GCCTGGGTGT   1860
GGAGGCGTTG GAGCATCTGA GTCCAGGGGA ACAGCTTCGG GGGGATTGCA TGTACGCCCC   1920
ACTTTTGGGA GTTCCACCCG CTGTGCGTCC CACTCCTTGT GCCCCATTGG CCGAATGCAA   1980
AGGTTCTCTG CTAGACGACA GCGCAGGCAA GAGCACTGAA GATACTGCTG AGTATTCCCC   2040
TTTCAAGGGA GGTTACACCA AAGGGCTAGA AGGCGAGAGC CTAGGCTGCT CTGGCAGCGC   2100
TGCAGCAGGG AGCTCCGGGA CACTTGAACT GCCGTCTACC CTGTCTCTCT ACAAGTCCGG   2160
AGCACTGGAC GAGGCAGCTG CGTACCAGAG TCGCGACTAC TACAACTTTC CACTGGCTCT   2220
GGCCGGACCG CCGCCCCCTC CGCCGCCTCC CCATCCCCAC GCTCGCATCA AGCTGGAGAA   2280
CCCGCTGGAC TACGGCAGCG CCTGGGCGGC TGCGGCGGCG CAGTGCCGCT ATGGGGACCT   2340
GGCGAGCCTG CATGGCGCGG GTGCAGCGGG ACCCGGTTCT GGGTCACCCT CAGCCGCCGC   2400
TTCCTCATCC TGGCACACTC TCTTCACAGC CGAAGAAGGC CAGTTGTATG GACCGTGTGG   2460
TGGTGGTGGG GGTGGTGGCG GCGGCGGCGG CGGCGGCGGC GGCGGCGGCG GCGGCGGCGG   2520
CGGCGGCGGC GAGGCGGGAG CTGTAGCCCC CTACGGCTAC ACTCGGCCCC CTCAGGGGCT   2580
GGCGGGCCAG GAAAGCGACT TCACCGCACC TGATGTGTGG TACCCTGGCG GCATGGTCAG   2640
CAGAGTGCCC TATCCCAGTC CCACTTGTGT CAAAAGCGAA ATGGGCCCCT GGATGGATAG   2700
CTACTCCGCA CCTTACGGGG ACATGCGTTT GGACACTGCC AGGGACCATG TTTTGCCCAT   2760
TGACTATTAC TTTCCACCCC AGAAGACCTG CCTCATCTGT GGAGATGAAG CTTCTGGGTG   2820
TCACTATGGA GCTCTCACAT GTGGAAGCTG CAAGGTCTTC TTCAAAAGAG CCGCTGAAGG   2880
GAAACAGAAG TACCTGTGCG CCAGCAGAAA TGATTGCACT ATTCATAAAT TCCGAAGGAA   2940
AAATTGTCCA TCTTGTCGTC TTCGGAAATG TTATGAAGCA GGGATGACTC TGGGAGCCCG   3000
GAAGCTGAAG AAACTTGGTA ATCTGAAACT ACAGGAGGAA GGAGAGGCTT CCAGCACCAC   3060
CAGCCCCACT GAGGAGACAA CCCAGAAGCT GACAGTGTCA CACATTGAAG GCTATGAATG   3120
TCAGCCCATC TTTCTGAATG TCCTGGAAGC CATTGAGCCA GGTGTAGTGT GTGCTGGACA   3180
CGACAACAAC CAGCCCGACT CCTTTGCAGC CTTGCTCTCT AGCCTCAATG AACTGGGAGA   3240
GAGACAGCTT GTACACGTGG TCAAGTGGGC CAAGGCCTTG CCTGGCTTCC GCAACTTACA   3300
CGTGGACGAC CAGATGGCTG TCATTCAGTA CTCCTGGATG GGGCTCATGG TGTTTGCCAT   3360
GGGCTGGCGA TCCTTCACCA ATGTCAACTC CAGGATGCTC TACTTCGCCC CTGATCTGGT   3420
TTTCAATGAG TACCGCATGC ACAAGTCCCG GATGTACAGC CAGTGTGTCC GAATGAGGCA   3480
CCTCTCTCAA GAGTTTGGAT GGCTCCAAAT CACCCCCCAG GAATTCCTGT GCATGAAAGC   3540
ACTGCTACTC TTCAGCATTA TTCCAGTGGA TGGGCTGAAA AATCAAAAAT TCTTTGATGA   3600
ACTTCGAATG AACTACATCA AGGAACTCGA TCGTATCATT GCATGCAAAA GAAAAAATCC   3660
CACATCCTGC TCAAGACGCT TCTACCAGCT CACCAAGCTC CTGGACTCCG TGCAGCCTAT   3720
TGCGAGAGAG CTGCATCAGT TCACTTTTGA CCTGCTAATC AAGTCACACA TGGTGAGCGT   3780
GGACTTTCCG GAAATGATGG CAGAGATCAT CTCTGTGCAA GTGCCCAAGA TCCTTTCTGG   3840
GAAAGTCAAG CCCATCTATT TCCACACCCA GTGAAGCATT GGAAACCCTA TTTCCCCACC   3900
CCAGCTCATG CCCCCTTTCA GATGTCTTCT GCCTGTTATA ACTCTGCACT ACTCCTCTGC   3960
AGTGCCTTGG GGAATTTCCT CTATTGATGT ACAGTCTGTC ATGAACATGT TCCTGAATTC   4020
TATTTGCTGG GCTTTTTTTT TCTCTTTCTC TCCTTTCTTT TTCTTCTTCC CTCCCTATCT   4080
AACCCTCCCA TGGCACCTTC AGACTTTGCT TCCCATTGTG GCTCCTATCT GTGTTTTGAA   4140
TGGTGTTGTA TGCCTTTAAA TCTGTGATGA TCCTCATATG GCCCAGTGTC AAGTTGTGCT   4200
TGTTTACAGC ACTACTCTGT GCCAGCCACA CAAACGTTTA CTTATCTTAT GCCACGGGAA   4260
GTTTAGAGAG CTAAGATTAT CTGGGGAAAT CAAAACAAAA AACAAGCAAA CAAAAAAAAA   4320
A
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Seq ID NO: 25 Protein sequence
Protein Accession #: NP_000035.1

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1          11         21         31         41         51
|          |          |          |          |          |
MEVQLGLGRV YPRPPSKTYR GAFQNLFQSV REVIQNPGPR HPEAASAAPP GASLLLLQQQ     60
QQQQQQQQQQ QQQQQQQQET SPRQQQQQQG EDGSPQAHRR GPTGYLVLDE EQQPSQPQSA    120
LECHPERGCV PEPGAAVAAS KGLPQQLPAP PDEDDSAAPS TLSLLGPTFP GLSSCSADLK    180
DILSEASTMQ LLQQQQQEAV SEGSSSGRAR EASGAPTSSK DNYLGGTSTI SDNAKELCKA    240
VSVSMGLGVE ALEHLSPGEQ LRGDCMYAPL LGVPPAVRPT PCAPLAECKG SLLDDSAGKS    300
TEDTAEYSPF KGGYTKGLEG ESLGCSGSAA AGSSGTLELP STLSLYKSGA LDEAAAYQSR    360
DYYNFPLALA GPPPPPPPPH PHARIKLENP LDYGSAWAAA AAQCRYGDLA SLHGAGAAGP    420
GSGSPSAAAS SSWHTLFTAE EGQLYGPCGG GGGGGGGGGG GGGGGGGGGG GGEAGAVAPY    480
GYTRPPQGLA GQESDFTAPD VWYPGGMVSR VPYPSPTCVK SEMGPWMDSY SGPYGDMRLE    540
TARDHVLPID YYFPPQKTCL ICGDEASGCH YGALTCGSCK VFFKRAAEGK QKYLCASRND    600
CTIDKFRRKN CPSCRLRKCY EAGMTLGARK LKKLGNLKLQ EEGEASSTTS PTEETTQKLT    660
VSHIEGYECQ PIFLNVLEAI EPGVVCAGHD NNQPDSFAAL LSSLNELGER QLVHVVKWAK    720
ALPGFRNLHV DDQMAVIQYS WMGLMVFAMG WRSFTNVNSR MLYFAPDLVF NEYRMHKSRM    780
YSQCVRMRHL SQEFGWLQIT PQEFLCMKAL LLFSIIPVDG LKNQKFFDEL RMNYIKELDR    840
IIACKRKNPT SCSRRFYQLT KLLDSVQPIA RELHQFTFDL LIKSHMVSVD FPEMMAEIIS    900
VQVPKILSGK VKPIYFHTQ
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Seq ID NO: 26 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
AGCATTATCC ATGGCCAGTG ATTGATGGAC TTGTTCAGGT CCTATGCAGA GTGCTTCATA     60
TATCTCATCT CAATCCTCTA AATAACCATG AAAGTTGATG ATTATCTCAT GGTACAGATG    120
GGAGGCTAAG AGTGTTTAAT TTTCCCCAAG TTCCAGTGCT AGTAAGTGTT GNNNNNNNNN    180
NNTGAACCTG TGTTAATGGT GTTTCTAGTC GATGCTGTTA TCTGTTGCAC CACATTTTGA    240
ATAATCTTGG ACTTTCAGAG TATGAAGGAC GATTAAATAT AACCCTTTGG TATAAATGTT    300
CTCTCTCTCG CTCCTCTGTA ACAATTGGAG AAACAGAGTT CTAACAATAT TAAAATCAGC    360
CATAGACAGA GAGTAGTGAG AAATATACTT TTTTTAATAC AGAAGGTTCC CTGAAGTACT    420
TTTAGTATTA TTCTAAATTA AGCAATAACC AATGAACAAT TTTGGTCATA AGCAGTTTCT    480
CTCCAGAAAA AAAAAAAAAA AGTCGAC
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Seq ID NO: 27 DNA sequence
Nucleic Acid Accession #: NM_006551.2
Coding sequence: 64..336

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1          11         21         31         41         51
|          |          |          |          |          |
AATTCTAGAA GTCCAAATCA CTCATTGTTT GTGAAAGCTG AGCTCACAGC AAAACAAGCC     60
ACCATGAAGC TGTCGGTGTG TCTCCTGCTG GTCACGCTGG CCCTCTGCTG CTACCAGGCC    120
AATGCCGAGT TCTGCCCAGC TCTTGTTTCT GAGCTGTTAG ACTTCTTCTT CATTAGTGAA    180
CCTCTGTTCA AGTTAAGTCT TGCCAAATTT GATGCCCCTC CGGAAGCTGT TGCAGCCAAG    240
TTAGGAGTGA AGAGATGCAC GGATCAGATG TCCCTTCAGA AACGAAGCCT CATTGCGGAA    300
GTCCTGGTGA AAATATTGAA GAAATGTAGT GTGTGACATG TAAAAACTTT CATCCTGGTT    360
TCCACTGTCT TTCAATGACA CCCTGATCTT CACTGCAGAA TGTAAAGGTT TCAACGTCTT    420
GCTTTAATAA ATCACTTGCT CTAC
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Seq ID NO: 28 Protein sequence
Protein Accession #: NP_006542.1

```
1          11         21         31         41         51
|          |          |          |          |          |
MKLSVCLLLV TLALCCYQAN AEFCPALVSE LLDFFFISEP LFKLSLAKFD APPEAVAAKL     60
GVKRCTDQMS LQKRSLIAEV LVKILKKCSV
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Seq ID NO: 29 DNA sequence
Nucleic Acid Accession #: NM_002645.1
Coding sequence: 1..5061

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1          11         21         31         41         51
|          |          |          |          |          |
ATGGCTCAGA TATTTAGCAA CAGCGGATTT AAAGAATGTC CATTTTCACA TCCGGAACCA     60
ACAAGAGCAA AAGATGTGGA CAAAGAAGAA GCATTACAGA TGGAAGCAGA GGCTTTAGCA    120
AAACTGCAAA AGGATAGACA AGTGACTGAC AATCAGAGAG GCTTTGAGTT GTCAAGCAGC    180
ACCAGAAAAA AAGCACAGGT TTATAACAAG CAGGATTATG ATCTCATGGT GTTTCCTGAA    240
TCAGATTCCC AAAAAAGAGC ATTAGATATT GATGTAGAAA AGCTCACCCA AGCTGAACTT    300
GAGAAACTAT TGCTGGATGA CAGTTTCGAG ACTAAAAAAA CACCTGTATT ACCAGTTACT    360
CCTATTCTGA GCCCTTCCTT TTCAGCACAG CTCTATTTTA GACCTACTAT TCAGAGAGGA    420
CAGTGGCCAC CTGGATTACC TGGGCCTTCC ACTTATGCTT TACCTTCTAT TTATCCTTCT    480
ACTTACAGTA AACAGGCTGC ATTCCAAAAT GGCTTCAATC CAAGAATGCC CACTTTTCCA    540
TCTACAGAAC CTATATATTT AAGTCTTCCG GGACAATCTC CATATTTCTC ATATCCTTTG    600
ACACCTGCCA CACCCTTTCA TCCACAAGGA AGCTTACCTA TCTATCGTCC AGTAGTCAGT    660
ACTGACATGG CAAAACTATT TGACAAAATA GCTAGTACAT CAGAATTTTT AAAAAATGGG    720
AAAGCAAGGA CTGATTTGGA GATAACAGAT TCAAAAGTCA GCAATCTACA GGTATCTCCA    780
AAGTCTGAGG ATATCAGTAA ATTTGACTGG TTAGACTTGG ATCCTCTAAG TAAGCCTAAG    840
GTGGATAATG TGGAGGTATT AGACCATGAG GAAGAGAAAA ATGTTTCAAG TTTGCTAGCA    900
AAGGATCCTT GGGATGCTGT TCTTCTTGAA GAGAGATCGA CAGCAAATTG TCATCTTGAA    960
AGAAAGGTGA ATGGAAAATC CCTTTCTGTG GCAACTGTTA CAAGAAGCCA GTCTTTAAAT   1020
ATTCGAACAA CTCAGCTTGC AAAAGCCCAG GGCCATATAT CTCAGAAAGA CCCAAATGGG   1080
ACCAGTAGTT TGCCAACTGG AAGTTCTCTT CTTCAAGAAG TTGAAGTACA GAATGAGGAG   1140
ATGGCAGCTT TTTGTCGATC CATTACAAAA TTGAAGACCA AATTTCCATA TACCAATCAC   1200
CGCACAAACC CAGGCTATTT GTTAAGTCCA GTCACAGCGC AAAGAAACAT ATGCGGAGAA   1260
AATGCTAGTG TGAAGGTCTC CATTGACATT GAAGGATTTC AGCTACCAGT TACTTTTACG   1320
TGTGATGTGA GTTCTACTGT AGAAATCATT ATAATGCAAG CCCTTTGCTG GGTACATGAT   1380
GACTTGAATC AAGTAGATGT TGGCAGCTAT GTTCTAAAAG TTTGTGGTCA AGAGGAAGTG   1440
CTGCAGAATA ATCATTGCCT TGGAAGTCAT GAGCATATTC AAAACTGTCG AAAATGGGAC   1500
ACAGAAATTA GACTACAACT CTTGACCTTC AGTGCAATGT GTCAAAATCT GGCCCGAACA   1560
GCAGAAGATG ATGAAACACC CGTGGATTTA AACAAACACC TGTATCAAAT AGAAAAACCT   1620
TGCAAAGAAG CCATGACGAG ACACCCTGTT GAAGAACTCT TAGATTCTTA TCACAACCAA   1680
GTAGAACTGG CTCTTCAAAT TGAAAACCAA CACCGAGCAG TAGATCAAGT AATTAAAGCT   1740
GTAAGAAAAA TCTGTAGTGC TTTAGATGGT GTCGAGACTC TTGCCATTAC AGAATCAGTA   1800
AAGAAGCTAA AGAGAGCAGT TAATCTTCCA AGGAGTAAAA CTGCTGATGT GACTTCTTTG   1860
TTTGGAGGAG AAGACACTAG CAGGAGTTCA ACTAGGGGCT CACTTAATCC TGAAAATCCT   1920
GTTCAAGTAA GCATAAACCA ATTAACTGCA GCAATTTATG ATCTTCTCAG ACTCCATGCA   1980
AATTCTGGTA GGAGTCCTAC AGACTGTGCC CAAAGTAGCA AGAGTGTCAA GGAAGCATGG   2040
ACTACAACAG AGCAGCTCCA GTTTACTATT TTTGCTGCTC ATGGAATTTC AAGTAATTGG   2100
GTATCAAATT ATGAAAAATA CTACTTGATA TGTTCACTGT CTCACAATGG AAAGGATCTT   2160
TTTAAACCTA TTCAATCAAA GAAGGTTGGC ACTTACAAGA ATTTCTTCTA TCTTATTAAA   2220
TGGGATGAAC TAATCATTTT TCCTATCCAG ATATCACAAT TGCCATTAGA ATCAGTTCTT   2280
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CACCTTACTC TTTTTGGAAT TTTAAATCAG AGCAGTGGAA GTTCCCCTGA TTCTAATAAG   2340
CAGAGAAAGG GACCAGAAGC TTTGGGCAAA GTTTCTTTAC CTCTTTGTGA CTTTAGACGG   2400
TTTTTAACAT GTGGAACTAA ACTTCTATAT CTTTGGACTT CATCACATAC AAATTCTGTT   2460
CCTGGAACAG TTACCAAAAA AGGATATGTC ATGGAAAGAA TAGTGCTACA GGTTGATTTT   2520
CCTTCTCCTG CATTTGATAT TATTTATACA ACTCCTCAAG TTGACAGAAG CATTATACAG   2580
CAACATAACT TAGAAACACT AGAGAATGAT ATAAAAGGGA AACTTCTTGA TATTCTTCAT   2640
AAAGACTCAT CACTTGGACT TTCTAAAGAA GATAAAGCTT TTTTATGGGA GAAACGTTAT   2700
TATTGCTTCA AACACCCAAA TTGTCTTCCT AAAATATTAG CAAGCGCCCC AAACTGGAAA   2760
TGGGGTAATC TTGCCAAAAC TTACTCATTG CTTCACCAGT GGCCTGCATT GTACCCACTA   2820
ATTGCATTGG AACTTCTTGA TTCAAAATTT GCTGATCAGG AAGTAAGATC CCTAGCTGTG   2880
ACCTGGATTG AGGCCATTAG TGATGATGAG CTAACAGATC TTCTTCCACA GTTTGTACAA   2940
GCTTTGAAAT ATGAAATTTA CTTGAATAGT TCATTAGTGC AATTCCTTTT GTCCAGGGCA   3000
TTGGGAAATA TCCAGATAGC ACACAATTTA TATTGGCTTC TCAAAGATGC CCTGCATGAT   3060
GTACAGTTTA GTACCCGATA CGAACATGTT TTGGGTGCTC TCCTGTCAGT AGGAGGAAAA   3120
CGACTTAGAG AAGAACTTCT AAAACAGACG AAACTTGTAC AGCTTTTAGG AGGAGTAGCA   3180
GAAAAAGTAA GGCAGGCTAG TGGATCAGCC AGACAGGTTG TTCTCCAAAG AAGTATGGAA   3240
CGAGTACAGT CCTTTTTTCA GAAAAATAAA TGCCGTCTCC CTCTCAAGCC AAGTCTAGTG   3300
GCAAAAGAAT TAAATATTAA GTCGTGTTCC TTCTTCAGTT CTAATGCTGT CCCCCTAAAA   3360
GTCACAATGG TGAATGCTGA CCCTCTGGGA GAAGAAATTA ATGTCATGTT TAAGGTTGGT   3420
GAAGATCTTC GGCAAGATAT GTTAGCTTTA CAGATGATAA AGATTATGGA TAAGATCTGG   3480
CTTAAAGAAG GACTAGATCT GAGGATGGTA ATTTTCAAAT GTCTCTCAAC TGGCAGAGAT   3540
CGAGGCATGG TGGAGCTGGT TCCTGCTTCC GATACCCTCA GGAAAATCCA AGTGGAATAT   3600
GGTGTGACAG GATCCTTTAA AGATAAACCA CTTGCAGAGT GGCTAAGGAA ATACAATCCC   3660
TCTGAAGAAG AATATGAAAA GGCTTCAGAG AACTTTATCT ATTCCTGTGC TGGATGCTGT   3720
GTAGCCACCT ATGTTTTAGG CATCTGTGAT CGACACAATG ACAATATAAT GCTTCGAAGC   3780
ACGGGACACA TGTTTCACAT TGACTTTGGA AAGTTTTTGG GACATGCACA GATGTTTGGC   3840
AGCTTCAAAA GGGATCGGGC TCCTTTTGTG CTGACCTCTG ATATGGCATA TGTCATTAAT   3900
GGGGGTGAAA AGCCCACCAT TCGTTTTCAG TTGTTTGTGG ACCTCTGCTG TCAGGCCTAC   3960
AACTTGATAA GAAAGCAGAC AAACCTTTTT CTTAACCTCC TTTCACTGAT GATTCCTTCA   4020
GGGTTACCAG AACTTACAAG TATTCAAGAT TTGAAATACG TTAGAGATGC ACTTCAACCC   4080.
CAAACTACAG ACGCAGAAGC TACAATTTTC TTTACTAGGC TTATTGAATC AAGTTTGGGA   4140
AGCATTGCCA CAAAGTTTAA CTTCTTCATT CACAACCTTG CTCAGCTTCG TTTTTCTGGT   4200
CTTCCTTCTA ATGATGAGCC CATCCTTTCA TTTTCACCTA AAACATACTC CTTTAGACAA   4260
GATGGTCGAA TCAAGGAAGT CTCTGTTTTT ACATATCATA AGAAATACAA CCCAGATAAA   4320
CATTATATTT ATGTAGTCCG AATTTTGTGG GAAGGACAGA TTGAACCATC ATTTGTCTTC   4380
CGAACATTTG TCGAATTTCA GGAACTTCAC AATAAGCTCA GTATTATTTT TCCACTTTGG   4440
AAGTTACCAG GCTTTCCTAA TAGGATGGTT CTAGGAAGAA CACACATAAA AGATGTAGCA   4500
GCCAAAAGGA AAATTGAGTT AAACAGTTAC TTACAGAGTT TGATGAATGC TTCAACGGAT   4560
GTAGCAGAGT GTGATCTTGT TTGTACTTTC TTCCACCCTT TACTTCGTGA TGAGAAAGCT   4620
GAAGGGATAG CTAGGTCTGC AGATGCAGGT TCCTTCAGTC CTACTCCAGG CCAAATAGGA   4680
GGAGCTGTGA AATTATCCAT CTCTTACCGA AATGGTACTC TTTTCATCAT GGTGATGCAT   4740
ATCAAAGATC TTGTTACTGA AGATGGAGCT GACCCAAATC CATATGTCAA AACATACCTA   4800
CTTCCAGATA ACCACAAAAC ATCCAAACGT AAAACCAAAA TTTCACGAAA AACGAGGAAT   4860
CCGACATTCA ATGAAATGCT TGTATACAGT GGATATAGCA AAGAAACCCT AAGACAGCGA   4920
GAACTTCAAC TAAGTGTACT CAGTGCAGAA TCTCTGCGGG AGAATTTTTT CTTGGGTGGA   4980
GTAACCCTGC CTTTGAAAGA TTTCAACTTG AGCAAAGAGA CGGTTAAATG GTATCAGCTG   5040
ACTGCGGCAA CATACTTGTA A
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Seq ID NO: 30 Protein sequence
Protein Accession #: NP_002636.1

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1          11         21         31         41         51
|          |          |          |          |          |
MAQIFSNSGF KECPFSHPEP TRAKDVDKEE ALQMEAEALA KLQKDRQVTD NQRGFELSSS     60
TRKKAQVYNK QDYDLMVFPE SDSQKRALDI DVEKLTQAEL EKLLLDDSFE TKKTPVLPVT    120
PILSPSFSAQ LYFRPTIQRG QWPPGLPGPS TYALPSIYPS TYSKQAAFQN GFNPRMPTFP    180
STEPIYLSLP GQSPYFSYPL TPATPFHPQG SLPIYRPVVS TDMAKLFDKI ASTSEFLKNG    240
KARTDLEITD SKVSNLQVSP KSEDISKFDW LDLDPLSKPK VDNVEVLDHE EEKNVSSLLA    300
KDPWDAVLLE ERSTANCHLE RKVNGKSLSV ATVTRSQSLN IRTTQLAKAQ GHISQKDPNG    360
TSSLPTGSSL LQEVEVQNEE MAAFCRSITK LKTKFPYTNH RTNPGYLLSP VTAQRNICGE    420
NASVKVSIDI EGFQLPVTFT CDVSSTVEII IMQALCWVHD DLNQVDVGSY VLKVCGQEEV    480
LQNNHCLGSH EHIQNCRKWD TEIRLQLLTF SAMCQNLART AEDDETPVDL NKHLYQIEKP    540
CKEAMTRHPV EELLDSYHNQ VELALQIENQ HRAVDQVIKA VRKICSALDG VETLAITESV    600
KKLKRAVNLP RSKTADVTSL FGGEDTSRSS TRGSLNPENP VQVSINQLTA AIYDLLRLHA    660
NSGRSPTDCA QSSKSVKEAW TTTEQLQFTI FAAHGISSNW VSNYEKYYLI CSLSHNGKDL    720
FKPIQSKKVG TYKNFFYLIK WDELIIFPIQ ISQLPLESVL HLTLFGILNQ SSGSSPDSNK    780
QRKGPEALGK VSLPLCDFRR FLTCGTKLLY LWTSSHTNSV PGTVTKKGYV MERIVLQVDF    840
PSPAFDIIYT TPQVDRSIIQ QHNLETLEND IKGKLLDILH KDSSLGLSKE DKAFLWEKRY    900
YCFKHPNCLP KILASAPNWK WGNLAKTYSL LHQWPALYPL IALELLDSKF ADQEVRSLAV    960
TWIEAISDDE LTDLLPQFVQ ALKYEIYLNS SLVQFLLSRA LGNIQIAHNL YWLLKDALHD   1020
VQFSTRYEHV LGALLSVGGK RLREELLKQT KLVQLLGGVA EKVRQASGSA RQVVLQRSME   1080
RVQSFFQKNK CRLPLKPSLV AKELNIKSCS FFSSNAVPLK VTMVNADPLG EEINVMFKVG   1140
EDLRQDMLAL QMIKIMDKIW LKEGLDLRMV IFKCLSTGRD RGMVELVPAS DTLRKIQVEY   1200
GVTGSFKDKP LAEWLRKYNP SEEEYEKASE NFIYSCAGCC VATYVLGICD RHNDNIMLRS   1260
TGHMFHIDFG KFLGHAQMFG SFKRDRAPFV LTSDMAYVIN GGEKPTIRFQ LFVDLCCQAY   1320
NLIRKQTNLF LNLLSLMIPS GLPELTSIQD LKYVRDALQP QTTDAEATIF FTRLIESSLG   1380
SIATKFNFFI HNLAQLRFSG LPSNDEPILS FSPKTYSFRQ DGRIKEVSVF TYHKKYNPDK   1440
HYIYVVRILW EGQIEPSFVF RTFVEFQELH NKLSIIFPLW KLPGFPNRMV LGRTHIKDVA   1500
AKRKIELNSY LQSLMNASTD VAECDLVCTF FHPLLRDEKA EGIARSADAG SFSPTPGQIG   1560
GAVKLSISYR NGTLFIMVMH IKDLVTEDGA DPNPYVKTYL LPDNHKTSKR KTKISRKTRN   1620
PTFNEMLVYS GYSKETLRQR ELQLSVLSAE SLRENFFLGG VTLPLKDFNL SKETVKWYQL   1680
TAATYL
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Seq ID NO: 31 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
TTTTTTTTAG AGACTAAACC ATAGCAAGGA GTTTGTGATC ACTGTATAGC GCTGAGTGAA    60
ACCTCAAAAT ACATTCTGGA ATTTGTAAGG GATGCTTTCG TCGACTTTTT TTTTTTTTTT   120
TTGGTATTTT CACTGTCAAT TATGCCTCGT ATTATTTATT TATTTGCCAA AATACGACTG   180
TATGAAAAAA AGCTACCTCA TAGAGCTCAT GACACATAAT AGGTATTCAC TGAGCATTTG   240
GTGATTTGTT AAGCACTCAC ATCAATAAAA TATTTCAGCT CAACAGGCAC ACTAGGGGCC   300
AGATGAGCAC TGACTTTCCC CATTGAGGAG TCTCGATTAC CTCATGTCTC ACTTCAAACA   360
ATTTATTTTT CTTGTATGCA TAGCTGGGTT CAAGAGTTCT TTCTTGTTTT GTCGGATATA   420
TTCTTTTTCT TTTGTTTTTG TAGGTCCTAT AATACAGTAA AGACATCAAA TAGACC
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Seq ID NO: 32 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
CAGTCAGATT TTTTTTTTGC TTAACTAAGA CAAAGTGAAT AATTCACTGT GAGCCAAATT    60
CTTTCTTGAT TCCTCTTTTT GGAGCAGTCC ATCTTTATGG GAAAACCAGC CTAGAATGGT   120
GATTTCAGTT TCAGGTGATT TCGATAGAAT TGTATTTGGC TCAGAAATGA TAAGACTGGG   180
GCCAAGAAAA ATTTTAAACT TTTTTTTTTG TAATCATATT ACTAGTTTGA TTTCATATGA   240
ACTTCCTTTG TTGACTTTCT TTGCCATTAA TTTAAAAGTT CCAGTATCCT CAATATTTGA   300
TGTCTTATAT GTACAGAATC CTTTCCAGCT GTAAGTCATC AGCAAGTAAA AAATTTAGTA   360
TGGCAATAGT TTTCATAAGA GGTTTTTTAA AACAGAAAAA TGTTGACATT GCCAGCCTCT   420
GGGTTGCATT TTGGGATATG CTACATTTCA AAGGTATCTT TTAAATCTGA AGGCAAAGAC   480
TTTTTCAACA TCTGAATATT CTGATTTACA GAAATTATAA AAAAAAAAGT CGACGCG
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Seq ID NO: 33 DNA sequence
Nucleic Acid Accession #: AK026418.1

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1          11         21         31         41         51
|          |          |          |          |          |
TTTTAAGATG GAGTTTTCGC TCTTGTTGCC CAGGCTGGAG TGCAGTGGTG CAATCTTGGC    60
TCACTGCAAC CTCTGCCCCC CGGGTTCAGG CGATTCTCTC CTCTCAGTCT CTCAAGTAAC   120
TGGGATTACA GGCACACACC ACCACGGCCA GCTAATTATT TTGTATTTTG AGTCGAGAGG   180
AGAATTCACC ATATTGGCCT CAGGTAATCC GCCCGCCTCG GCCTCCCAAA GTGTTGGGAT   240
TATGGGCGTG AGCCAGCCAC GGTGCCCGGC CCGTTTTATT GTTTGAAAAA CAAGTACAGG   300
TTGTTATTAT CCAAGAATTG TTGATAGAGT ATATACTGTA TTTGAAGTGT AGAACTGAGG   360
CAGAGGCTGA TTAATATAAC TAGTTTACAT TTGTTAGCCT TTCACATCTG TGAAGGAATA   420
AAGTACAGAC AAAAGTGGAA AACAAACCAG AAAAAAAAAA ATTGTGAAGC ACAGAGCTGC   480
TTAAAAGAGT GGTGTCACAT TAAAAGAAAA AAGTCACAGA AATAAGTCAG TATTTTGTTT   540
AGAGACTAGA ACTCCAACTG CTAGCCAACT GCCTAGAATA TAGTAAATAT TTTCTAGTTT   600
CTTAAATGAC TAGTAATATT CCTACATTAT GTGATGGCAT TTCCCAAACT GTTTAATTAG   660
ATGTTAGATT TGTAGCCAAA TATGTCTAGG AAATGCTTAA ACAATATAAA ACAGTTTTAA   720
TGATTGGCTT TTTAGAACGT TATATATTAG TGTGCTTTAT GCATATCCAA GAGGTGAGTG   780
AGGTATTTGG GGTTTTTCAG ACTTACTTGA TTACAGATCT GGAGTATCTC AAAACAGTTG   840
TTTTGTGGAA AACACTTTGG CAAACTCTGA GTCTTAGTCA TTAAAAATAG TTTTTGGGTA   900
AACAACAGTG TAATAGAAAT GGAAATTACT GATTCACATT GAGCCATGAA GAATTTATTT   960
TCAGCGATTT TTATAGAAGT TGCTTTATGA CAAAGAAAGC TTTGGTTAAC TGGCATTTGG  1020
CATTTCACAC CCCTAAATTT TCTACATGAG GATTTATTTC TCTGGTTCTC TCACTTTCTC  1080
ACTCAGTTAT ACTGAATTCA TTTATGATGA GCGCTCTCAA CCATTCTTAT TCATCAAAGC  1140
TGAAGTTGGC AGAGCCCTCT CTGGTACCTG ATTAGAAGTC CGTCTTCCGT CTCATAGGGA  1200
AGTGTTAGAG ATGGATAATG TTTCTGTGTA GCAGAAGTAG TCATTATGTC CCCTTAAATT  1260
CGGTCACTTT GACTGCAGTA GAGCTTCTTA GTGAGCAGTC TGTGATGGAG TATACTTTCG  1320
GAGAAGCTCA TGGTGGGGGA AACCTGGAAT TTATCTAAAT ATTTCATTTC TTTGATAAAT  1380
TACATTAAAA AATTAATAAG AGTATCTATT TGGTGAAATC ATTTTCCTCC ACGTGACCAA  1440
ATGAGAAATT TAGTGAAAGA TTTAAAATCA TTTTTCAGAC TTTTTCCACA TTAGTTGGGA  1500
AGCAAACCCC TTTTTTAAGG CAATGTCAGT TATTAAGCTT TAGGGAACCA CATGCCACTT  1560
TAGGTAACAC ATGATTGGAG AGATTGAAGA GTGAAGTCCC TGCTTTAAAG TGTACTCCTG  1620
TGGACACAGT AATGCATATA TTTAAAATGG TTCATGTTAA GAGTAGGTAT ATTTCTATCT  1680
AAATACTCTG TAGCTTTTGT GATTCAGGGA AATGAGTGGA GCCTCACAGG CACAAGAATC  1740
TAGTAAATTC TAGGTTTCTT GTGTGGAACT CAGTGGGCAA AATCTTAACT GAGTGAATTC  1800
TTGATTATTG GTATCACATT TATTAGTCTG TATGTATCTG TGTCATCGAT CTCCTTAAGA  1860
AGAGACTCGT AGATATTGAC TGGGAGACCC AAGCTGAATG CTAAAATCTG CTCCATGGAT  1920
ATAAGCTGAT GCAGTCATCA TTTCACATTA AAATGTACCA CAGCTATATA TGCCGCAAAA  1980
AAAAAAAAAA AAAA
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Seq ID NO: 34 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
CTACTACTAA ATTCGCGGCC GCGTCGACTT TTTTTTTTTT TTGTCTTATG TCTCTAATCT    60
GCACTGTTCA GCTCTTTTAG GCACTGCAAA GTTGTCTTGA ATTAGGAAAG AGGTGCTAGA   120
ATGTGGGCGT GGGTGTTGAC CTACATCTGA ACAATTTACA TATGATTCAC CACAATTAAA   180
CAATTTGGTT TGAAATAGCT ATAATTAAGT TATTATCAGA GAAGTATTTA CTAGTCTAGA   240
AATTCTAAAT TTATCTTCAC ATACACCCTA ACTGAGAAAA GGGCCACATT TTCTGCACTC   300
TATTAAGTAA AGCAAATGCT GAACTAAATG CCTCCATGTT AACATTTATA TTGTTAAGTT   360
ACTGACAGCA TATTCTATGA ATGATTACGT TAGTCGTTTC TTTAAAAATT ATAGGTTTGA   420
AATAGCAAGA AAAATATGAA ATGATGGTAG ACAAAAAAGA GTTTCAGTTT CTAACTTCTA   480
ACTATATATA TACACACACA CATGCACACA GAATTGCCTT CCCGGATGTA TAGAAATTAT   540
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ATACAGCCAT GTCCAGGCNC GATGGAAATT ATGGGGGAAT ATCCAANTTA GGATACNCGT    600
GCCGAATCGC CGGGTNTAAA TAATACNGGT TTATAATGGA CNATCCACAA TCCTGGTTTA
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Seq ID NO: 35 DNA sequence
Nucleic Acid Accession #: NM_018490.1
Coding sequence: 445..3300

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TGGGGCGAGT GGCCGGCATG GCTGAAGGCT GCGCTCTGCA ACCTTGAAGA GCCGCTGCAT    120
TGAGAGGCCA GGGACAGGGA GACCGGTGCG ATGGCAGAGC GCGGCCCCCG CCGCTGCGCC    180
GGGCCGGCCC GGCTGGCCTG AGCCGCCGGA GGAGCGGGGC TGCCTCTGCG CGTCCATGGA    240
GCAGCGGGAA GGGCGAAACT CCGGAGCGCC GCGTCCCTGC GCCGCTGCGG CGGACTGCTG    300
AAGGGGCCGA GCCCGCGCGG ACCGCCGAGG AAGAGACCCC CGCTCCAGCC CGCAGGCCGG    360
CTGCCCGGGG GCGGCGGGGG ACATCGGAGG GCAGCGGAGC GAGCAGCGCC GCGGGAGAGG    420
CCGGCGCGGG AGGCGGCCGC AGCAATGCCG GGCCCGCTAG GGCTGCTCTG CTTCCTCGCC    480
CTGGGGCTGC TCGGCTCGGC CGGGCCCAGC GGCGCGGCGC CGCCTCTCTG CGCGGCGCCC    540
TGCAGCTGCG ACGGCGACCG TCGGGTGGAC TGCTCCGGGA AGGGGCTGAC GGCCGTGCCC    600
GAGGGGCTCA GCGCCTTCAC CCAAGCGCTG GATATCAGTA TGAACAACAT TACTCAGTTG    660
CCAGAAGATG CATTTAAGAA CTTTCCTTTT CTAGAAGAGC TACAATTGGC GGGCAACGAC    720
CTTTCTTTTA TCCACCCAAA GGCCTTGTCT GGGTTGAAAG AACTCAAAGT TCTAACGCTC    780
CAGAATAATC AGTTGAAAAC AGTACCCAGT GAAGCCATTC GAGGGCTGAG TGCTTTGCAG    840
TCTTTGCGTT TAGATGCCAA CCATATTACC TCAGTCCCCG AGGACAGTTT TGAAGGACTT    900
GTTCAGTTAC GGCATCTGTG GCTGGATGAC AACAGCTTGA CGGAGGTGCC TGTGCACCCC    960
CTCAGCAATC TGCCCACCCT ACAGGCGCTG ACCCTGGCTC TCAACAAGAT CTCAAGCATC   1020
CCTGACTTTG CATTTACCAA CCTTTCAAGC CTGGTAGTTC TGCATCTTCA TAACAATAAA   1080
ATTAGAGGCC TGAGTCAACA CTGTTTTGAT GGACTAGATA ACCTGGAGAC CTTAGACTTG   1140
AGTTATAATA ACTTGGGGGA ATTTCCTCAG GCTATTAAAG CCCGTCCTAG CCTTAAAGAG   1200
CTAGGATTTC ATAGTAATTC TATTTCTGTT ATCCCTGATG GAGCATTTGA TGGTAATCCA   1260
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CACAATTTAT CTGATCTTCA TTCCCTAGTC ATTCGTGGTG CAAGCATGGT GCAGCAGTTC   1380
CCCAATCTTA CAGGAACTGT CCACCTGGAA AGTCTGACTT TGACAGGTAC AAAGATAAGC   1440
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AATAATATAA GAGACCTTCC AAGTTTTAAT GGTTGCCATG CTCTGGAAGA AATTTCTTTA   1560
CAGCGTAATC AAATCTACCA AATAAAGGAA GGCACCTTTC AAGGCCTGAT ATCTCTAAGG   1620
ATTCTAGATC TGAGTAGAAA CCTGATACAT GAAATTCACA GTAGAGCTTT TGCCACACTT   1680
GGGCCAATAA CTAACCTAGA TGTAAGTTTC AATGAATTAA CTTCCTTTCC TACGGAAGGC   1740
CCGAATGGGC TAAATCAACT GAAACTTGTG GGCAACTTCA AGCTGAAAGA AGCCTTAGCA   1800
GCAAAAGACT TTGTTAACCT CAGGTCTTTA TCGGTACCAT ATGCTTATCA GTGCTGTGCA   1860
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AGTGTGGCAC AGGAGAAAGG TACTGCTGAT GCAGCAAATG TCACAAGCAC TCTTGAAAAT   1980
GAAGAACATA GTCAAATAAT TATCCATTGT ACACCTTCAA CAGGTGCTTT TAAGCCCTGT   2040
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ATCCTAACTT TTCTTGATGC TGTGTCCTGG GGCAGATTCG CTGAATTTGG CATTTGGTGG   2280
GAAACTGGCA GTGGCTGCAA AGTAGCTGGG TTTCTTGCAG TTTTCTCCTC AGAAAGTGCC   2340
ATATTTTTAT TAATGCTAGC AACTGTCGAA AGAAGCTTAT CTGCAAAAGA TATAATGAAA   2400
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GCTACAGTAG CAGGCTGTTT TCCCCTTTTC CATAGAGGGG AATATTCTGC ATCACCCCTT   2520
TGTTTGCCAT TTCCTACAGG TGAAACGCCA TCATTAGGAT TCACTGTAAC GTTAGTGCTA   2580
TTAAACTCAC TAGCATTTTT ATTAATGGCC GTTATCTACA CTAAGCTATA CTGCAACTTG   2640
GAAAAAGAGG ACCTCTCAGA AAACTCACAA TCTAGCATGA TTAAGCATGT CGCTTGGCTA   2700
ATCTTCACCA ATTGCATCTT TTTCTGCCCT GTGGCGTTTT TTTCATTTGC ACCATTGATC   2760
ACTGCAATCT CTATCAGCCC CGAAATAATG AAGTCTGTTA CTCTGATATT TTTTCCATTG   2820
CCTGCTTGCC TGAATCCAGT CCTGTATGTT TTCTTCAACC CAAAGTTTAA AGAAGACTGG   2880
AAGTTACTGA AGCGACGTGT TACCAAGAAA AGTGGATCAG TTTCAGTTTC CATCAGTAGC   2940
CAAGGTGGTT GTCTGGAACA GGATTTCTAC TACGACTGTG GCATGTACTC ACATTTGCAG   3000
GGCAACCTGA CTGTTTGCGA CTGCTGCGAA TCGTTTCTTT TAACAAAGCC AGTATCATGC   3060
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GAGGGCTACT GGTCCGACTG TGGCACACAG TCGGCCCACT CTGATTATGC AGATGAAGAA   3180
GATTCCTTTG TCTCAGACAG TTCTGACCAG GTGCAGGCCT GTGGACGAGC CTGCTTCTAC   3240
CAGAGTAGAG GATTCCCTTT GGTGCGCTAT GCTTACAATC TACCAAGAGT TAAAGACTGA   3300
ACTACTGTGT GTGTAACCGT TTCCCCCGTC AACCAAAATC AGTGTTTATA GAGTGAACCC   3360
TATTCTCATC TTTCATCTGG GAAGCACTTC TGTAATCACT GCCTGGTGTC ACTTAGAAGA   3420
AGGAGAGGTG GCAGTTTATT TCTCAAACCA GTCATTTTCA AAGAACAGGT GCCTAAATTA   3480
TAAATTGGTG AAAAATGCAA TGTCCAAGCA ATGTATGATC TGTTTGAAAC AAATATATGA   3540
CTTGAAAAGG ATCTTAGGTG TAGTAGAGCA ATATAATGTT AGTTTTTTCT GATCCATAAG   3600
AAGCAAATTT ATACCTATTT GTGTATTAAG CACAAGATAA AGAACAGCTG TTAATATTTT   3660
TTAAAAATCT ATTTTAAAAT GTGATTTTCT ATAACTGAAG AAAATATCTT GCTAATTTTA   3720
CCTAATGTTT CATCCTTAAT CTCAGGACAA CTTACTGCAG GGCCAAAAAA GGGACTGTCC   3780
CAGCTAGAAC TGTGAGAGTA TACATAGGCA TTACTTTATT ATGTTTTCAC TTGCCATCCT   3840
TGACATAAGA GAACTATAAA TTTTGTTTAA GCAATTTATA AATCTAAAAC CTGAAGATGT   3900
TTTTAAAACA ATATTAACAG CTGTTAGGTT AAAAAAATAG CTGGACATTT GTTTTCAGTC   3960
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TAGCAATAGC TTGGATTATA TAGAAAGTAA ACTGTGGTCA ATACTTGCAT TTAATTAGAC   4260
GAAACGGGGA GTAATTATGA CACGAAGTAC TTATGTTTAT TTCTTAGTGA GCTGGATTAT   4320
CTTGAACCTG TGCTATTAAA TGGAAATTTC CATACATCTT CCCCATACTA TTTTTTATAA   4380
AAGAGCCTAT TCAATAGCTC AGAGGTTGAA CTCTGGTTAA ACAAGATAAT ATGTTATTAA   4440
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TAAAAATAGA AGAAGAAAGA ATAAAGCTTA GTCCTGTGTC TTTAAAAATT AAAAATTTTA 4500
CTTGATTCCC ATCTATGGGC TTTAGACCTA TTACTGGGTG GAGTCTTAAA GTTATAATTG 4560
TTCAATATGT TTTTTGAACA GTGTGCTAAA TCAATAGCAA ACCCACTGCC ATATTAGTTA 4620
TTCTGAATAT ACTAAAAAAA TCCAGCTAGA TTGCAGTTTA ATAATTAAAC TGTACATACT 4680
GTGCATATAA TGAATTTTTA TCTTATGTAA ATTATTTTTA GAACACAAGT TGGGAAATGT 4740
GGCTTCTGTT CATTTCGTTT AATTAAAGCT ACCTCCTAAA CTATAGTGGC TGCCAGTAGC 4800
AGACTGTTAA ATTGTGGTTT ATATACTTTT TGCATTGTAA ATAGTCTTTG TTGTACATTG 4860
TCAGTGTAAT AAAAACAGAA TCTTTGTATA TCAAAATCAT GTAGTTTGTA TAAAATGTGG 4920
GAAGGATTTA TTTACAGTGT GTTGTAATTT TGTAAGGCCA ACTATTTACA AGTTTTAAAA 4980
ATTGCTATCA TGTATATTTA CACATCTGAT AAATATTAAA TCATAACTTG GTAAGAAACT 5040
CCTAATTAAA AGGTTTTTTC CAAAATTCAG GTTATTGAAA ATTTTTCATT TTATTCATTT 5100
AAAAACTAGA ATAACAGATA TATAAAAGTG TTAATCTTTG TGCTATATGG TATGAAATAC 5160
AATATTGTAC TCAGTGTTTT GAATTATTAA AGTTTCTAGA AAGCAAAAAA A
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Seq ID NO: 36 Protein sequence
Protein Accession #: NP_060960.1

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MPGPLGLLCF LALGLLGSAG PSGAAPPLCA APCSCDGDRR VDCSGKGLTA VPEGLSAFTQ   60
ALDISMNNIT QLPEDAFKNF PFLEELQLAG NDLSFIHPKA LSGLKELKVL TLQNNQLKTV  120
PSEAIRGLSA LQSLRLDANH ITSVPEDSFE GLVQLRHLWL DDNSLTEVPV HPLSNLPTLQ  180
ALTLALNKIS SIPDFAFTNL SSLVVLHLHN NKIRGLSQHC FDGLDNLETL DLSYNNLGEF  240
PQAIKARPSL KELGFHSNSI SVIPDGAFDG NPLLRTIHLY DNPLSFVGNS ASHNLSDLHS  300
LVIRGASMVQ QFPNLTGTVH LESLTLTGTK ISSIPNNLCQ EQKMLRTLDL SYNNIRDLPS  360
FNGCHALEEI SLQRNQIYQI KEGTFQGLIS LRILDLSRNL IHEIHSRAFA TLGPITNLDV  420
SFNELTSFPT EGPNGLNQLK LVGNFKLKEA LAAKDFVNLR SLSVPYAYQC CAFWGCDSYA  480
NLNTEDNSLQ DHSVAQEKGT ADAANVTSTL ENEEHSQIII HCTPSTGAFK PCEYLLGSWM  540
IRLTVWFIFL VALFFNLLVI LTTFASCTSL PSSKLFIGLI SVSNLFMGIY TGILTFLDAV  600
SWGRFAEFGI WWETGSGCKV AGFLAVFSSE SAIFLLMLAT VERSLSAKDI MKNGKSNHLK  660
QFRVAALSAF LGATVAGCFP LFHRGEYSAS PLCLPFPTGE TPSLGFTVTL VLLNSLAFLL  720
MAVIYTKLYC NLEKEDLSEN SQSSMIKHVA WLIFTNCIFF CPVAFFSFAP LITAISISPE  780
IMKSVTLIFF PLPACLNPVL YVFFNPKFKE DWKLLKRRVT KKSGSVSVSI SSQGGCLEQD  840
FYYDCGMYSH LQGNLTVCDC CESFLLTKPV SCKHLIKSHS CPALAVASCQ RPEGYWSDCG  900
TQSAHSDYAD EEDSFVSDSS DQVQACGRAC FYQSRGFPLV RYAYNLPRVK D
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Seq ID NO: 37 DNA sequence
Nucleic Acid Accession #: AF144648.1
Coding sequence: 1..1884

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AACCTCTTCA ACTGCAAAAA TTGTGCAAAT GAAGCTGTGG TTCAAAAGAT TTTGGACAGG  180
GTGCTGTCAA GATACGATGT CCGCCTGAGA CCGAATTTTG GAGGTGCCCC TGTGCCTGTG  240
AGAATATCTA TTTATGTCAC GAGCATTGAA CAGATCTCAG AAATGAATAT GGACTACACG  300
ATCACGATGT TTTTTCATCA GACTTGGAAA GATTCACGCT TAGCATACTA TGAGACCACC  360
CTGAACTTGA CCCTGGACTA TCGGATGCAT GAGAAGTTGT GGGTCCCTGA CTGCTACTTT  420
TTGAACAGCA AGGATGCTTT CGTGCATGAT GTGACTGTGG AGAATCGCGT GTTTCAGCTT  480
CACCCAGATG GAACGGTGCG GTACGGCATC CGACTCACCA CTACAGCAGC TTGTTCCCTG  540
GATCTGCATA AATTCCCTAT GGACAAGCAG GCCTGCAACC TGGTGGTAGA GAGCTATGGT  600
TACACGGTTG AAGACATCAT ATTATTCTGG GATGACAATG GGAACGCCAT CCACATGACT  660
GAGGAGCTGC ATATCCCTCA GTTCACTTTC CTGGGAAGGA CGATTACTAG CAAGGAGGTG  720
TATTTCTACA CAGGTTCCTA CATACGCCTG ATACTGAAGT TCCAGGTTCA GAGGGAAGTT  780
AACAGCTACC TTGTGCAAGT CTACTGGCCT ACTGTCCTCA CCACTATTAC CTCTTGGATA  840
TCGTTTTGGA TGAACTATGA TTCCTCTGCA GCCAGGGTGA CAATTGGCTT AACTTCAATG  900
CTCATCCTGA CCACCATCGA CTCACATCTG CGGGATAAGC TCCCCAACAT TTCCTGTATC  960
AAGGCCATTG ATATCTATAT CCTCGTGTGC TTGTTCTTTG TGTTCCTGTC CTTGCTGGAG 1020
TATGTCTACA TCAACTATCT TTTCTACAGT CGAGGACCTC GGCGCCAGCC TAGGCGACAC 1080
AGGAGACCCC GAAGAGTCAT TGCCCGCTAC CGCTACCAGC AAGTGGTGGT AGGAAACGTG 1140
CAGGATGGCC TGATTAACGT GGAAGACGGA GTCAGCTCTC TCCCCATCAC CCCAGCGCAG 1200
GCCCCCCTGG CAAGCCCGGA AAGCCTCGGT TCTTTGACGT CCACCTCCGA GCAGGCCCAG 1260
CTGGCCACCT CGGAAAGCCT CAGCCCACTC ACTTCTCTCT CAGGCCAGGC CCCCCTGGCC 1320
ACTGGAGAAA GCCTGAGCGA TCTCCCCTCC ACCTCAGAGC AGGCCCGGCA CAGCTATGGT 1380
GTTCGCTTTA ATGGTTTCCA GGCTGATGAC AGTATTTTTC CTACCGAAAT CCGCAACCGT 1440
GTCGAAGCCC ATGGCCATGG TGTTACCCAT GACCATGAAG ATTCCAATGA GAGCTTGAGC 1500
TCGGATGAGC GCCATGGCCA TGGCCCCAGT GGGAAGCCCA TGCTTCACCA TGGCGAGAAG 1560
GGTGTGCAAG AAGCAGGCTG GGACCTTGAT GACAACAATG ACAAGAGCGA CTGCCTTGCC 1620
ATTAAGGAGC AATTCAAGTG TGATACTAAC AGTACCTGGG GCCTTAATGA TGATGAGCTC 1680
ATGGCCCATG GCCAAGAGAA GGACAGTAGC TCAGAGTCTG AGGATAGTTG CCCCCCAAGC 1740
CCTGGGTGCT CCTTCACTGA AGGGTTCTCC TTCGATCTCT TTAATCCTGA CTACGTCCCA 1800
AAGGTCGACA AGTGGTCCCG GTTCCTCTTC CCTCTGGCCT TTGGGTTGTT CAACATTGTT 1860
TACTGGGTAT ACCATATGTA TTAG
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Seq ID NO: 38 Protein sequence
Protein Accession #: AAD51172.1

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1          11         21         31         41         51
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VLSRYDVRLR PNFGGAPVPV RISIYVTSIE QISEMNMDYT ITMFFHQTWK DSRLAYYETT  120
LNLTLDYRMH EKLWVPDCYF LNSKDAFVHD VTVENRVFQL HPDGTVRYGI RLTTTAACSL  180
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DLHKFPMDKQ ACNLVVESYG YTVEDIILFW DDNGNAIHMT EELHIPQFTF LGRTITSKEV   240
YFYTGSYIRL ILKFQVQREV NSYLVQVYWP TVLTTITSWI SFWMNYDSSA ARVTIGLTSM   300
LILTTIDSHL RDKLPNISCI KAIDIYILVC LFFVFLSLLE YVYINYLFYS RGPRRQPRRH   360
RRPRRVIARY RYQQVVVGNV QDGLINVEDG VSSLPITPAQ APLASPESLG SLTSTSEQAQ   420
LATSESLSPL TSLSGQAPLA TGESLSDLPS TSEQARHSYG VRFNGFQADD SIFPTEIRNR   480
VEAHGHGVTH DHEDSNESLS SDERHGHGPS GKPMLHHGEK GVQEAGWDLD DNNDKSDCLA   540
IKEQFKCDTN STWGLNDDEL MAHGQEKDSS SESEDSCPPS PGCSFTEGFS FDLFNPDYVP   600
KVDKWSRFLF PLAFGLFNIV YWVYHMY
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Seq ID NO: 39 DNA sequence
Nucleic Acid Accession #: U47334.1
Coding sequence: 1..331

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TAATGAAGAT GAGCTCATGG CCCATGGCCA AGAGAAGGAC AGTAGCTCAG AGTCTGAGGA   180
TAGTTGCCCC CCAAGCCCTG GGTGCTCCTT CACTGAAGGG TTCTCCTTCG ATCTCCTTAA   240
TCCTGACTAC GTCCCAAAGG TCGACAAGTG GTCCCGGTTC CTCTTCCCTC TGGCCTTTGG   300
GTTGTTCAAC ATTGTAGCGG CCGAACGATG C
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Seq ID NO: 40 Protein sequence
Protein Accession #: AAC50559.1

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1          11         21         31         41         51
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KNCANEAVVQ KILDRVLSRY DVRLRPNFGX MLATNSTRGL NEDELMAHGQ EKDSSSESED    60
SCPPSPGCSF TEGFSFDLLN PDYVPKVDKW SRFLFPLAFG LFNIVAAERC
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Seq ID NO: 41 DNA sequence
Nucleic Acid Accession #: NM_020974
Coding sequence: 81..3080

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CCGCAACCGC TGAGCCATCC ATGGGGGTCG CGGGCCGCAA CCGTCCCGGG GCGGCCTGGG   120
CGGTGCTGCT GCTGCTGCTG CTGCTGCCGC CACTGCTGCT GCTGGCGGGG GCCGTCCCGC   180
CGGGTCGGGG CCGTGCCGCG GGGCCGCAGG AGGATGTAGA TGAGTGTGCC CAAGGGCTAG   240
ATGACTGCCA TGCCGACGCC CTGTGTCAGA ACACACCCAC CTCCTACAAG TGCTCCTGCA   300
AGCCTGGCTA CCAAGGGGAA GGCAGGCAGT GTGAGGACAT CGATGAATGT GGAAATGAGC   360
TCAATGGAGG CTGTGTCCAT GACTGTTTGA ATATTCCAGG CAATTATCGT TGCACTTGTT   420
TTGATGGCTT CATGTTGGCT CATGACGGTC ATAATTGTCT TGATGTGGAC GAGTGCCTGG   480
AGAACAATGG CGGCTGCCAG CATACCTGTG TCAACGTCAT GGGGAGCTAT GAGTGCTGCT   540
GCAAGGAGGG GTTTTTCCTG AGTGACAATC AGCACACCTG CATTCACCGC TCGGAAGAGG   600
GCCTGAGCTG CATGAATAAG GATCACGGCT GTAGTCACAT CTGCAAGGAG GCCCCAAGGG   660
GCAGCGTCGC CTGTGAGTGC AGGCCTGGTT TTGAGCTGGC CAAGAACCAG AGAGACTGCA   720
TCTTGACCTG TAACCATGGG AACGGTGGGT GCCAGCACTC CTGTGACGAT ACAGCCGATG   780
GCCCAGAGTG CAGCTGCCAT CCACAGTACA AGATGCACAC AGATGGGAGG AGCTGCCTTG   840
AGCGAGAGGA CACTGTCCTG GAGGTGACAG AGAGCAACAC CACATCAGTG GTGGATGGGG   900
ATAAACGGGT GAAACGGCGG CTGCTCATGG AAACGTGTGC TGTCAACAAT GGAGGCTGTG   960
ACCGCACCTG TAAGGATACT TCGACAGGTG TCCACTGCAG TTGTCCTGTT GGATTCACTC  1020
TCCAGTTGGA TGGGAAGACA TGTAAAGATA TTGATGAGTG CCAGACCCGC AATGGAGGTT  1080
GTGATCATTT CTGCAAAAAC ATCGTGGGCA GTTTTGACTG CGGCTGCAAG AAAGGATTTA  1140
AATTATTAAC AGATGAGAAG TCTTGCCAAG ATGTGGATGA GTGCTCTTTG GATAGGACCT  1200
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GTCAGCAGGT CTGTGTGAAC ACAGTGGGCA GCTATGAATG CCAGTGCCAC CCTGGGTACA  1380
AGCTCCACTG GAATAAAAAA GACTGTGTGG AAGTGAAGGG GCTCCTGCCC ACAAGTGTGT  1440
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CAGCACTACC AGAGAAGCAC AGCTCAGTAA AAGAGAGCTT CCGCTACGTA AACCTTACAT  1680
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TGAGCTGCAT CGTAAAGCGA ACCGAGAAGC GGCTCCGTAA AGCCATCCGC ACGCTCAGAA  1860
AGGCCGTCCA CAGGGAGCAG TTTCACCTCC AGCTCTCAGG CATGAACCTC GACGTGGCTA  1920
AAAAGCCTCC CAGAACATCT GAACGCCAGG CAGAGTCCTG TGGAGTGGGC CAGGGTCATG  1980
CAGAAAACCA ATGTGTCAGT TGCAGGGCTG GGACCTATTA TGATGGAGCA CGAGAACGCT  2040
GCATTTTATG TCCAAATGGA ACCTTCCAAA ATGAGGAAGG ACAAATGACT TGTGAACCAT  2100
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GTGCCCTGGG CACGTTCCAG CCTGAAGCTG GTCGAACTTC CTGCTTCCCC TGTGGAGGAG  2280
GCCTTGCCAC CAAACATCAG GGAGCTACTT CCTTTCAGGA CTGTGAAACC AGAGTTCAAT  2340
GTTCACCTGG ACATTTCTAC AACACCACCA CTCACCGATG TATTCGTTGC CCAGTGGGAA  2400
CATACCAGCC TGAATTTGGA AAAAATAATT GTGTTTCTTG CCCAGGAAAT ACTACGACTG  2460
ACTTTGATGG CTCCACAAAC ATAACCCAGT GTAAAAACAG AAGATGTGGA GGGGAGCTGG  2520
GAGATTTCAC TGGGTACATT GAATCCCCAA ACTACCCAGG CAATTACCCA GCCAACACCG  2580
AGTGTACGTG GACCATCAAC CCACCCCCCA AGCGCCGCAT CCTGATCGTG GTCCCTGAGA  2640
TCTTCCTGCC CATAGAGGAC GACTGTGGGG ACTATCTGGT GATGCGGAAA ACCTCTTCAT  2700
CCAATTCTGT GACAACATAT GAAACCTGCC AGACCTACGA ACGCCCCATC GCCTTCACCT  2760
CCAGGTCAAA GAAGCTGTGG ATTCAGTTCA AGTCCAATGA AGGGAACAGC GCTAGAGGGT  2820
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TCCAGGTCCC ATACGTGACA TATGATGAGG ACTACCAGGA ACTCATTGAA GACATAGTTC  2880
GAGATGGCAG GCTCTATGCA TCTGAGAACC ATCAGGAAAT ACTTAAGGAT AAGAAACTTA  2940
TCAAGGCTCT GTTTGATGTC CTGGCCCATC CCCAGAACTA TTTCAAGTAC ACAGCCCAGG  3000
AGTCCCGAGA GATGTTTCCA AGATCGTTCA TCCGATTGCT ACGTTCCAAA GTGTCCAGGT  3060
TTTTGAGACC TTACAAATGA CTCAGCCCAC GTGCCACTCA ATACAAATGT TCTGCTATAG  3120
GGTTGGTGGG ACAGAGCTGT CTTCCTTCTG CATGTCAGCA CAGTCGGGTA TTGCTGCCTC  3180
CCGTATCAGT GACTCATTAG AGTTCAATTT TTATAGATAA TACAGATATT TTGGTAAATT  3240
GAACTTGGTT TTTCTTTCCC AGCATCGTGG ATGTAGACTG AGAATGGCTT TGAGTGGCAT  3300
CAGCTTCTCA CTGCTGTGGG CGGATGTCTT GGATAGATCA CGGGCTGGCT GAGCTGGACT  3360
TTGGTCAGCC TAGGTGAGAC TCACCTGTCC TTCTGGGGTC TTACTCCTCC TCAAGGAGTC  3420
TGTAGTGGAA AGGAGGCCAC AGAATAAGCT GCTTATTCTG AAACTTCAGC TTCCTCTAGC  3480
CCGGCCCTCT CTAAGGGAGC CCTCTGCACT CGTGTGCAGG CTCTGACCAG GCAGAACAGG  3540
CAAGAGGGGA GGGAAGGAGA CCCCTGCAGG CTCCCTCCAC CCACCTTGAG ACCTGGGAGG  3600
ACTCAGTTTC TCCACAGCCT TCTCCAGCCT GTGTGATACA AGTTTGATCC CAGGAACTTG  3660
AGTTCTAAGC AGTGCTCGTG AAAAAAAAAA GCAGAAAGAA TTAGAAATAA ATAAAAACTA  3720
AGCACTTCTG GAGACAT
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Seq ID NO: 42 Protein sequence
Protein Accession #: NP_066025

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1          11         21         31         41         51
|          |          |          |          |          |
MGVAGRNRPG AAWAVLLLLL LLPPLLLLAG AVPPGRGRAA GPQEDVDECA QGLDDCHADA    60
LCQNTPTSYK CSCKPGYQGE GRQCEDIDEC GNELNGGCVH DCLNIPGNYR CTCFDGFMLA   120
HDGHNCLDVD ECLENNGGCQ HTCVNVMGSY ECCCKEGFFL SDNQHTCIHR SEEGLSCMNK   180
DHGCSHICKE APRGSVACEC RPGFELAKNQ RDCILTCNHG NGGCQHSCDD TADGPECSCH   240
PQYKMHTDGR SCLEREDTVL EVTESNTTSV VDGDKRVKRR LLMETCAVNN GGCDRTCKDT   300
STGVHCSCPV GFTLQLDGKT CKDIDECQTR NGGCDHFCKN IVGSFDCGCK KGFKLLTDEK   360
SCQDVDECSL DRTCDHSCIN HPGTFACACN RGYTLYGFTH CGDTNECSIN NGGCQQVCVN   420
TVGSYECQCH PGYKLHWNKK DCVEVKGLLP TSVSPRVSLH CGKSGGGDGC FLRCHSGIHL   480
SSDVTTIRTS VTFKLNEGKC SLKNAELFPE GLRPALPEKH SSVKESFRYV NLTCSSGKQV   540
PGAPGRPSTP KEMFITVEFE LETNQKEVTA SCDLSCIVKR TEKRLRKAIR TLRKAVHREQ   600
FHLQLSGMNL DVAKKPPRTS ERQAESCGVG QGHAENQCVS CRAGTYYDGA RERCILCPNG   660
TFQNEEGQMT CEPCPRPGNS GALKTPEAWN MSECGGLCQP GEYSADGFAP CQLCALGTFQ   720
PEAGRTSCFP CGGGLATKHQ GATSFQDCET RVQCSPGHFY NTTTHRCIRC PVGTYQPEFG   780
KNNCVSCPGN TTTDFDGSTN ITQCKNRRCG GELGDFTGYI ESPNYPGNYP ANTECTWTIN   840
PPPKRRILIV VPEIFLPIED DCGDYLVMRK TSSSNSVTTY ETCQTYERPI AFTSRSKKLW   900
IQFKSNEGNS ARGFQVPYVT YDEDYQELIE DIVRDGRLYA SENHQEILKD KKLIKALFDV   960
LAHPQNYFKY TAQESREMFP RSFIRLLRSK VSRFLRPYK
```

Seq ID NO: 43 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
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TTTCCATCTC ATTAATTCTC CTGCAGCAAT TCATAACTCT TTGGGGGCAT TCCTTTGTTT   120
TTTGATATGA CTACTACCTG ACTGTATATA GTTTCCCTTT TTTTTTTTTC CTCCCAGATT   180
CTCTCCTTTC TACTGGCATC CTTTTCCATT TTACTCAATT TTCCTCAGTT AGGTTGACTT   240
GCTTTTATAC CTGTGTGATG CTCCTTGCCA GATATCTAGC AAATGCCCCC AGGATCCAAT   300
CATTTTTTTC CTAAGAAAAC TGAAAAGAAG CATGGCAAAT AACAGAGCTT GGAAAATAGG   360
AAACTTTAAA ATACAAAGCC CAGTGAAATC TACTTGGAAG CCAATGCTTA GAGGCAAGAG   420
ACAGTGATTC AAATAGGTGT TGANNNNNNN NNNNNNNNNN NATGATCAGC ATAGCAAAGA   480
TCACTTTCCA ACATTGGAAA GTTATGCATA TTCCAATTGA GCTAGCCCTT TTAAACAGCC   540
TTAAAATTGT ATAAAAGAGA AGAAATTTAA GATATTGAAA ACTGGTAGAT AATAAAACCT   600
AAATAAAGCT GGTTTTGGAA GAGCAGTGGC CACTGTGATT GACAATGGGG GCACTTACTG   660
TTAAGGGGAT TTATAACAGA AGTACTTGAA CAGAATTGTG AAGAGAATAG AATTGTGCAT   720
TCTTTTATCT GCCCAGAACC ACAGCTCCCA TGGGAAATAC TCCACCTCAT TCTACAACCT   780
TCTGGCTGCA ACAAAAGCAG TCAAATTAAA ACATAACCCA AAGGGGGTAC CTAACCCAAC   840
TTGAGAAAAT CATAGCATNC TCCCTTTGGC TATAACTNTT TCCACATGAA ATACATTCAA   900
ATGCCTT
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Seq ID NO: 44 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
TTTTTTTTTT TTTTTTTGGA TTTTAGTATG CCTTGCAATT TTTTCCCTTT ATTCTGATGC    60
ATGAAGTACC CACTAAAAGT GACTGCTGTT AGTATAGCTT CAGTAATGAG GTGATGAGGT   120
GACAGGGCAG GTGATGCTCT CTTAGTCTCT TTAGGCTACT ATTACAAAAT ACTTCAGACT   180
GAGTAATTCA TAAACAACAG AGATTATTGT TCACAGATCT GGAGGCTGGA AAGTACAAGA   240
CTAAAGGGCC AGAATATTTG GTGTTTGGTG AAGGTCAAAC ATTCAGACAC TCTCAACGAC   300
TATAGCGACA GCAGCAGTCT TCAGGAATCC TATGTGAGGG ACAAACACTC AGAAGCCAGC   360
TGGAGTGTTC TAGAATCCTA TGTGAGGGAC AAACATTCAG ACCCCAGCAG TAGTGTTGTG   420
GAATCCTATG TGAGGGACAA ACTTTCAAAC CCTTGTAGCA GTGTTCTGGA ATCCTATGTG   480
AGGGACAAAA ATTCAGAACC TTGTAGCAGT GTTCTGGAAT CCTATGTGAG CAACAATCA
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Seq ID NO: 45 DNA sequence
Nucleic Acid Accession #: Eos sequence
Coding sequence: 31..1092

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1          11         21         31         41         51
|          |          |          |          |          |
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GCCAAGCACG AAGGGTTCCG CGCGCCTTCC TCAGAGCCTG CGCACCCTGT TCGACATCCT     60
GACGACCGGC GGCGCGGCTG CGTGCACCTG CGCACCTCCT TCTTGAAGCG CCGACGGCGG    120
GCCCCCCGGG ACCCCACGCG CGCCCCGGCC CGGCCCGGGG ATCAGCCGCC GCCGCCGCCG    180
CAAGCGCCTT GGTGTTCGCT CCGGCCGACG AGCCGCGGAC GGTCCTGGAG AGGAAGCCCC    240
TGCCCCTGGG CGTGCGCGCC CCTCTGGCCG GTCCCAGCGC CGCCGCCCGC AGCCCGGAGC    300
AGCTGTGCGC CCCGGCTGAG GCGGCGCCCT GCCCCGCGGA GCCCGAGCGG TCCCAGAGCG    360
CGGCGCTGGA ACCGAGCTCC AGCGCGGACG CAGGGACGGG ACCGGGGAGC GGCTCTTCGT    420
GGACTCCGGA TCCTGGAGGG CGCCTCGGCG GGTCTGGAGG GAAAGGGCTT CATGCTTGTC    480
GCGGTGCAGT GGCGTGCAGG GCCCTGGAGC GGACTCAGGG GATGCCCGGC GGGCTCCCCG    540
TGCCCGAGGG GAACGTCGGA GGCACACCAT CGCCAGCGGC GTGGACTGCG GCCTGCTGAA    600
GCAGATGAAG GAGCTGGAGC AGGAGAAGGA GGTGCTGCTG CAGGGTTTGG AGATGATGGC    660
GCGGGGCCGC GACTGGTACC AGCAGCAGCT GCAACGAGTG CAGGAGCGCC AGCGCCGCCT    720
GGGCCAGAGC AGAGCCAGCG CCGACTTTGG GGCTGCAGGG AGCCCCCGCC CACTGGGGCG    780
GCTACTGCCC AAGGTACAAG AGGTGGCCCG GTGCCTGGGG GAGCTGCTGG CTGCAGCCTG    840
TGCCAGCCGG GCCCTGCCCC CGTCCTCCTC CGGGCCCCCC TGCCCTGCCC TGACGTCCAC    900
CTCACCCCCG GTCTGGCAGC AGCAGACCAT CCTCATGCTG AAGGAGCAGA ACCGACTCCT    960
CACCCAGGAG GTGACCGAGA AGAGTGAGCG CATCACGCAG CTGGAGCAGG AGAAGTCGGC   1020
GCTCATTAAG CAGCTGTTTG AGGCCCGCGC CCTGAGCCAG CAGGACGGGG GACCTCTGGA   1080
TTCCACCTTC ATCTAGTCCT TGTGGGCCGC GTGGGCCCCC AGGGCCAGCC TGGCACTCAG   1140
CCCTTCGAGG GTGGGCGCCC CATCGCACCC ACCCTCTCTG GCTGGAGACC CCCGGCAGGC   1200
CCAGGCACAG TCCCGGAGTG GGCGCCTTCC TGCCGCCCTT GCCAGATGGG CTCCCCAGGC   1260
CTGCCCCCGG CTGGTCCCCG CACCGAGCGC TTGACTCCGT TTTGGCTCCT GGTTGYTGAC   1320
ATGGGCTGGG GGCTCTCTTG AGTCCGCATA GTCCGCAGCT ACTACTGGCC GCTGTCAGTG   1380
GACAGTGGGG TACCCCTCCA TGAGTTAGCG TCCCCCCGTT TCCAGCGGTG CCGCCCTGGG   1440
TCCCATCTTC AGGGAAAGGC ACTGCCCACG CCAGGCTGCA CTTCCAACAA CGGGCAGCAG   1500
AGGGCGCGGG GCGGCTCCGA CGCGGGTCCA AGGGCAGCTT CCCGCTCAAC CAGGGCACCA   1560
GGACGAGGTG GCTGTAGCTC GGACGGACGG AAGTAGATGG AGGGGGTGGG GACGGCCTGT   1620
AAGCGGGGGG TGCCTGCCTG GCTGGGGAGC CCCAGGGATA GCGGTCGGAC TTCAGGTTCT   1680
GGCCAAGGCT GAGGGACCCT GGCTGCAGCG GATCGGCACG CCGGGTGGGC GAGAGCTTGG   1740
CCTGCATGTG CCTCCCACAG ACCCTGGGGT GATGGCCTTC CCCCTCTTGG CCGGGACGTT   1800
GCCCCACGTT GAGTCCCACA CAACATCCTG TGAGCCTGGC TCCCCAGGAG GGCCCCCAGA   1860
CAGCTCCCAG GCACGTCATA GGCAAAGCCT GTTTCCCCCG ACTCAGGATT TCCAAGGCCT   1920
GGGGTCCTGC TCACCCCCCT TTGCTCTCAC GCCCAGCCTG TCCCCAGGTT TCAGCTGGGA   1980
GAGGCCACCT CCCTCAGCCA AGGAAAACGA GAACCCCCAG GGTACAGGAG GAGGCTGGGG   2040
CAGGTCCCCT TGGGTGTCAC TCCCTCAGCC CCTGCCCAGG CCCACTCCCG CTGGTGCTGG   2100
AGTACGCACT GGTGGGGGGG CCCTGCTCAG CCCAACCTGG AGGGTCCCAG TGTCACCAGA   2160
ACCAGGGGCA CGGCAACAGC ATCGATGGGT TCTGCAGCCC AGGGCCCCCG ATGCGGGGTC   2220
AGTGTGTGTG GGGCGCAGGG CCTCCGATGC GGGGTCAGTG CGTGGGGGGC GCAGGGCCCC   2280
CGATGCGGGG TCAGTGCGTG GGGGGCGCAG GGCCCCCTCG TGTCCAGGGC ACTTTGGTAC   2340
ACTGTCCCAC AAGGCACCTG TCTCAGAGGA GGGGCCCTGG CAGGCAGCGT GGCAACTCCT   2400
TCCGGAGCCC AGCTCCATGC TAACCTGCCC ACAGCAACCC CACAGAGCCA CATTCCCTGC   2460
TGCACCTGGT CTGCAGGGTG TCCCAGGACA GGCCCAAGTC AGCCCAGCAT GCAGCTGCCC   2520
TCCTACCCTG AAGATGGGAG TGGGCTTTCC AGGGGACATA AGGATGTCAG GCCTGGACCT   2580
CCTGGGCAGG AAAGGGTGCA GGTCCTGAGG GCCTGTGCCC CACAGCCCCA GCACCCAGGT   2640
GGACTGCAGC GCAGTGGGTG GGCCAGTGGC AGCCAGGGAG AAGCCCCCCG TCAGCAGGCT   2700
GGGGTCTGCC CACCAGGGCC TCCCCACGTC TGCCTTTGAG GGTGCCTGCC ATGCCCTGGG   2760
GGATCCTGGC ATCTTTACTG GACTGGAAGC AGGAGACAGA ACAGTGTCTG TCCCGGGGTG   2820
ACTTCATCAG GAGACCGCCC ACATAGAGCT GGACCCCGCA GCTGAAGCGG AAATGTGAGA   2880
CAGGCTGGCA CCTCCGGAAA AACTGCCTTT CAGCCTTGGT GTTCCGTGCA AGGTGAAAAG   2940
AAATAGGTCC TCCCAGTTTA CAGCTTGAAA TCAGGCTAGT GAGTGGCCCT GGAGACCACG   3000
AGGGGAGAAT TTAAAGGCCC CGGCTGGCAG GGTCTAGGTG GCTGGCAGAG GCACATGCAG   3060
ACCCTGCCTG GAGCCTGCCC TAGGACGCTG GGCGGGTCAG TCTCCGTGCA GGATGTGAGC   3120
AGCGTCCCTG GGCTCTATCC GCGAGGTGCC AGTAGCGTGT GCAGGTACAT ACACGTGCGT   3180
GCACACTGTG ATGACACCCG GAAATGTCTC AGGATGTTGA AATGTGTCCT TGGGGGCAGA   3240
AGTGTCCCCA GTTGAGAATC TGCCCCAGAG GAACACACCC ACACCAGGCC TCAGGATTTT   3300
GTGTTGATCA AGTTCCAAGG AAAAGGAACA TCTCAGCCGG GCGTGGTGGT TCACGCCTGG   3360
AATCCCAGCA CTTGAGGCCA GGAGTTCCAG AGCAGCCTGG GCAACGCAGT GAGAGACCCC   3420
ATCTCTACAA RAAAAAAAAA AGAAAGAAAG AAAATGAGAG ATCCAGGTTT AAAAATTCAT   3480
AAACACCACA AGGAAACAAT ACACTATGAG ACCCAGCAGA AGCAACAGAT TGACTCTAGA   3540
CCCAGATACT AGAATTATCA GAGAGAATAT AAAGTAACAG TGTTTTATAT ATCTAAAGAA   3600
ATAAAAGAGA TTTCTGGAAA CATGAAAAAA AA
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Seq ID NO: 46 Protein sequence
Protein Accession #: Eos sequence

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1          11         21         31.        41         51
|          |          |          |          |          |
MKVESRGPPS CWLRARASNS CLMSADFSCS SCVMRSLFSV TSWVRSRFCS FSMRMVCCCQ     60
TGGEVDVRAG QGGPEEDGGR ARLAQAAASS SPRHRATSCT LGSSRPSGRG LPAAPKSALA    120
LLWPRRRWRS CTRCSCCWYQ SRPRAIISKP CSSTSFSCSS SFICFSRPQS TPLAMVCLRR    180
SPRARGARRA SPESAPGPCT PLHRDKHEAL SLQTRRGALQ DPESTKSRSP VPSLRPRWSS    240
VPAPRSGTAR APRGRAPPQP GRTAAPGCGR RRWDRPEGRA RPGAGASSPG PSAARRPERT    300
PRRLRRRRRL IPGPGRGARG VPGGPPSALQ EGGAQVHAAA PPVVRMSNRV RRL
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Seq ID NO: 47 DNA sequence
Nucleic Acid Accession #: NM_020957.1
Coding sequence: 1156..3486

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CTGATTTATA GTCCTGTACT TTCTCTACGT GCCATATCCA TTATTAAAGA AATGAGTCTA    120
AGTAGGAAGT AGAGTTAACC TATAGTTTCA TTTCTTGAAT TTCTTATTCT CTTTCTTCAG    180
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TCTTTTTCAG TTAACCTACA CACACACACA CACACACACA CACACACACA CACATATGTT   240
TATAAGTGGG ATGGGAGAAC GGGTACGGTG ATAATTAAAA GAGGTAAGGT TTCTCTTGAG   300
ATGAAAATGT TCTAAAATTG TCATGGCGGA TGCACACCTC TGAATATATT AAAAGCCATT   360
GAAATGAAAA AAGGGTGGGG GGAATCCAAA AGTGTAGCAG ACCCAACCTT GAGATTTGCT   420
TGTTTGGGAA TGAATTTTCC AATAACTTGA AAGTTGTAAA AACTCACACT TCTCAGGGTT   480
AGGTGTCAGA AAGAAAAGGA AGTAATTTAT TCTTTAATAA AGCAATTGTT AAATACTCTT   540
TAGAACTACC ACTGATTGCA ATTTTGCAGT GTCTACTCAT AGTGTCTATA TAGGTACCAT   600
GAAAAAGATG TACTTGTGAA ACTGTTCTCA TGTTACTTCA GAAAAATTTT GCTTCTAAGT   660
GTGTATTCTA TGTCTGGTTA AATGTTCATT GAATTTTATT TAATCATTAA TCTCAACAGC   720
ATTAAACAGT CAATAACATA AATGACAGTC TTCTCTTTGT ACTCCTCCCT GTACAACATC   780
ACAGAGCTCC ATCTGTATAC ACGAAAGTCA CATGAAAATA GAACTCAGTG TTTTGTATTA   840
CATAGTCTAT TCAGTACATT TAGAAGTATT TTGCCTCCAA TATTCAACCA CAGTAAAAGA   900
CTCAGTGAGA ACGCGTGGTG GCGCTGCAGG TTAAGATGAC GGAAAATACA ACTGCCTACG   960
CAGCTCCAGG ATCCAGCAAA CCGTTTCCCA AAGCCTGGAA GCAAAAGAAT AGCTGAGCCA  1020
GAGCGAACGT GAGTGTGAAA CCTCTTTAAG ACACCGTTGG GCTGCTTGGT TCTGACATTC  1080
TGGACTGCAA AACAGTTCTA CTAGGATCCT GGGGATACAT GAAGCTTCTG TGAACCAACT  1140
TTTCAACAAA AAGCAATGGA GATTGGATGG ATGCACAATC GGAGACAAAG GCAAGTCCTT  1200
GTTTTCTTTG TTTTGCTGAG CTTGTCTGGG GCGGGCGCCG AGTTGGGGTC CTATTCCGTA  1260
GTGGAAGAAA CGGAGAGAGG CTCTTTTGTG GCAAATCTAG GAAAAGACCT GGGGTTGGGG  1320
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GATGGTGGCT CTCCACCGCG ATCTGGAACT GCTCAGGTCC GTATTGAAGT GGTGGACATC  1860
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CCTCTTGGCT CCCTGGTTGC CACCGTCTCC GCCAGGGATT TAGACGGCGG AGCCAATGGA  1980
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GAAGTGCGCA TCAAAGCCAC AGATGGGGGA GGTCTTTCAG GAAAGTGCAC TCTTCTCCTG  2160
CAGGTGGTGG ACGTGAATGA CAATCCCCCA CAGGTGACCA TGTCTGCACT CACCAGCCCC  2220
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TCAGTCAAGA ACTTTTACAC CTTGGTAACG GAGAGAGCAC TCGACAGAGA AGCAAGAGCT  2400
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TCGGGCCAGA ATGCCTGGCT GTCGTACCAG CTGCTCAAGG CCACGGAGCC CGGGCTGTTC  3000
GGTGTGTGGG CGCACAATGG CGAGGTGCGC ACCGCCAGGC TGCTGAGCGA GCGCGACGCA  3060
GCCAAGCAGA GGCTGGTGGT GCTGGTCAAG GACAATGGCG AGCCTCCGCG CTCGGCCACC  3120
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CTGGTGGACG TAAGCGGCAC CGGGACCCTG TCCCAGAGCT ACCAATACGA GGTGTGTCTG  3420
ACAGGAGGCT CAGAAACAAG TGAGTTCAAG TTCCTGAAGC CGATTATCCC CAACTTCTCT  3480
CCTTAGGGCA CTAGGAAAGA AATAGATTAA AATTCCACCC TTCACAATAG CTTTGGATTT  3540
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AAATTGTTCA TGCTCACCAC CACCAATAAG GTATTTTTCT CTGATTGTTA GTTCAAATTA  3660
TATTGTTAAT TCCAGTTTCC CTTTTCCTCA TATTTACCCC GAAGAGGTGT TGCATATAGA  3720
ATCCCAATTA ACAAAATATA CTTTATCTTC AAAGTTGATG TCATTTAAAA TTTTTCCGTC  3780
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ACTGCAACCT CTGCCTCCTG GGCTCAACGG ATCCTTCCAC CTCAGCCTCC CAAGTAGCTT  4140
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ATCTCCTTAA ATAAAATAAA ATATTCCTAT TGTAAGTGAT ATGAGAAATC TTTAACCAGC  4440
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TACTGAATTA AAAAATCAGA GGTCCCTGTT ATATTTTTAA TGGCTAACAA CTCAATCTCA  4620
TTAAGTTGGA AAAAAAACTT ATCAAAGAGA CATTTACATG GTTTGGCTTT TATATTCATC  4680
ATAGTATACA TTGGCGGTAT CTAGCCCTTT CTCTGTAAAA TATCCCTATG TTTAATCTGT  4740
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ATTCTATGTG AGTCAGAAAA AAAAAAA
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Seq ID NO: 48 Protein sequence
Protein Accession #: NP_066008.1

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1         11        21        31        41        51
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|          |          |          |          |          |
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TRKARIISQG NKQHLQLKAQ TGDLLINEKL DREELCGPTE PCILHFQVLM ENPLEIFQAE   120
LRVIDINDHS PMFTEKEMIL KIPENSPLGT EFPLNHALDL DVGSNNVQNY KISPSSHFRV   180
LIHEFRDGRK YPELVLDKEL DREEEPQLRL TLTALDGGSP PRSGTAQVRI EVVDINDNAP   240
EFEQPIYKVQ IPENSPLGSL VATVSARDLD GGANGKISYT LFQPSEDISK TLEVNPMTGE   300
VRLRKQVDFE MVTSYEVRIK ATDGGGLSGK CTLLLQVVDV NDNPPQVTMS ALTSPIPENS   360
PEIVVAVFSV SDPDSGNNGK TISSIQEDLP FLLKPSVKNF YTLVTERALD REARAEYNIT   420
LTVTDMGTPR LKTEHNITVQ ISDVNDNAPT FTQTSYTLFV RENNSPALHI GSVSATDRDS   480
GTNAQVTYSL LPPQDPHLPL ASLVSINADN GHLFALRSLD YEALREFEFR VSATDRGSPA   540
LSSEALVRVL VLDANDNSPF VLYPLQNGSA PCTELVPRAA EPGYLVTKVV AVDGDSGQNA   600
WLSYQLLKAT EPGLFGVWAH NGEVRTARLL SERDAAKQRL VVLVKDNGEP PRSATATLHV   660
LLVDGFSQPF LPLPEAAPGQ TQANSLTVYL VVALASVSSL FLFSVLLFVA VRLCRRSRAA   720
SVGRCSMPEG PFPGRLVDVS GTGTLSQSYQ YEVCLTGGSE TSEFKFLKPI IPNFSP
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Seq ID NO: 49 DNA sequence
Nucleic Acid Accession #: CAT cluster

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1          11         21         31         41         51
|          |          |          |          |          |
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Seq ID NO: 50 DNA sequence
Nucleic Acid Accession #: AF034799.1
Coding sequence: 170..3943

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Seq ID NO: 51 Protein sequence
Protein Accession #: AAC26100.1

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EEEISELKAE RNNTRLLLEH LECLVSRHER SLRMTVVKRQ AQSPSGVSSE VEVLKALKSL   180
FEHHKALDEK VRERLRVSLE RVSALEEELA AANQEIVALR EQNVHIQRKM ASSEGSTESE   240
HLEGMEPGQK VHEKRLSNGS IDSTDETSQI VELQELLEKQ NYEMAQMKER LAALSSRVGE   300
VEQEAETARK DLIKTEEMNT KYQRDIREAM AQKEDMEERI TTLEKRYLSA QRESTSIHDM   360
NDKLENELAN KEAILRQMEE KNRQLQERLE LAEEKLQQTM RKAETLPEVE AELAQRIAAL   420
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NRTQQIGVLS SHPFESDTEM SDIDDDDRET IFSSMDLLSP SGHSDAQTLA MMLQEQLDAI   660
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GHSTPKLTPR SPAREMDRMG VMTLPSDLRK HRRKIAVVEE DGREDKATIK CETSPPPTPR   780
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FPPREVHGIS MMPGSSETLP AGFRLTTTSG QSRKMTTDVA SSRLQRLDNS TVRTYSC
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It is understood that the examples described above in no way serve to limit the true scope of this invention, but rather are presented for illustrative purposes. All publications, sequences of accession numbers, and patent applications cited in this specification are herein incorporated by reference as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference.

WHAT IS CLAIMED IS:

1. A method of detecting an androgen-independent prostate cancer cell in a sample from a patient having undergone androgen ablation therapy, the method comprising determining the presence or absence of a nucleic acid comprising a sequence at least 80% identical to a sequence as shown in Tables 1A-4.

2. The method of claim 1, wherein said determining is by hybridizing with a polynucleotide that selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1A-4.

3. The method of claim 1, wherein the biological sample:
   a) is a tissue sample; or
   b) comprises isolated nucleic acids.

4. The method of claim 3:
   a) wherein the nucleic acids are mRNA; or
   b) further comprising the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide.

5. The method of claim 2, wherein the polynucleotide:
   a) comprises a sequence as shown in Tables 1A-4;
   b) is labeled, including a fluorescent label; or
   c) is immobilized on a solid surface.

6. The method according to claim 1,wherein said biological sample is contacted with a plurality of polynucleotides that each selectively hybridizes to a sequence at least 95% identical to a first sequence as shown in Tables 1A-4.

7. The method according to claim 6,wherein said plurality of polynucleotides are immobilized on a solid surface.

8. An isolated polypeptide which is encoded by a nucleic acid molecule having polynucleotide sequence as shown in Tables 1A-4.

9. An antibody that specifically binds a polypeptide of claim 8.

10. The antibody of claim 9:

a) further conjugated to an effector component, including a fluorescent label a radioisotope or a cytotoxic chemical; or

b) which is an antibody fragment or humanized antibody.

11. A method of detecting an androgen-independent prostate cancer cell in a patient having undergone androgen ablation therapy, the method comprising contacting a samp from said patient with an antibody of claim 9.

12. The method of claim11, wherein:

a) the antibody is further conjugated to an effector component, e.g., a fluoresce label; or.

b) said sample comprises a cell.

13. A method of detecting antibodies specific to androgen-independent prostate can a patient having undergone androgen ablation, the method comprising contacting a biol sample from the patient with a polypeptide encoded by a nucleic acid comprising a seq from Tables 1A-4.

14. A method of inhibiting proliferation of androgen-independent prostate cancer ce a patient having undergone androgen ablation therapy, the method comprising administ to the patient a therapeutically effective amount of a compound that specifically elimina cells expressing an antigen listed in Tables 1A-4.

15. The method of claim 14, wherein the compound is an antibody.

16. A drug screening assay comprising the steps of:

a) administering a test compound to a mammal having a prostate proliferative condition or a cell isolated therefrom;

b) comparing the level of gene expression of a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4 in a treated cell or mammal with the level of gene expression of the polynucleotide in a control cell or mammal, wherein a test compound that modulates the level of expression of the polynucleotide is a candidate for the treatment of prostate cancer.

17. The assay of claim 16, wherein:

a) the control is a mammal with prostate cancer or a cell therefrom that has not been treated with the test compound; or

b) the control is a normal cell or mammal.

18. A method for treating a mammal having a prostate proliferative condition or prostate cancer comprising administering a compound identified by the assay of claim 16.

19. A pharmaceutical composition for treating a mammal having a prostate proliferative condition or prostate cancer, the composition comprising a compound identified by the assay of claim 16 and a physiologically acceptable excipient.

20. A method of detecting a prostate cancer associated transcript, the method comprising contacting a biological sample from the patient with a plurality of polynucleotides wherein at least two of said polynucleotides selectively hybridize to a difference sequence at least 80% identical to a sequence as shown in Tables 1A-4.

21. A method of detecting a prostate cancer, the method comprising the steps of:

a) providing a biological sample from a patient;

b) contacting the biological sample with a first polynucleotide that selectively hybridizes to a sequence at least 80% identical to a first sequence as shown in Tables 1A-4, to determine the level of a prostate cancer-associated transcript in the biological sample; and with a second polynucleotide that selectively

hybridizes to a second sequence at least 80% identical to a sequence not shown in Tables 1A-4; wherein the expression of said second sequence is not substantially changed in prostate cancer, to determine the level of expression of a control transcript in the biological sample; and

c) comparing the level of the prostate cancer-associated transcript to a level of the normal tissue associated transcript in the biological sample.

22. A method for quantitation of a prostate cancer-associated transcript in a cell from a patient, the method comprising contacting a biological sample from the patient with a polynucleotide that selectively hybridizes to a sequence at least 80% identical to a sequence as shown in Tables 1A-4.

23. The method of claim 22, wherein:

a) the polynucleotide selectively hybridizes to a sequence at least 95% identical to a sequence as shown in Tables 1A-4;
b) the biological sample is a tissue sample;
c) the biological sample comprises isolated nucleic acids;
d) the nucleic acids are mRNA;
e) further comprising the step of amplifying nucleic acids before the step of contacting the biological sample with the polynucleotide;
f) the polynucleotide comprises a sequence as shown in Tables 1A-4;
g) the polynucleotide is labeled, including a fluorescent label; or
h) the polynucleotide is immobilized on a solid surface.

24. A biochip comprising a plurality of polynucleotides that selectively hybridize to a sequence at least 80% identical to a sequence as shown in Tables 1A-4.

25. A method of screening drug candidates comprising:

a) providing a cell that expresses an expression profile gene selected from the group consisting of an expression profile gene set forth in Tables 1A-4 or fragment thereof;
b) adding a drug candidate to said cell; and

c) determining the effect of said drug candidate on the expression of said expression profile gene.

26. A method according to claim 22 wherein said determining comprises comparing the level of expression in the absence of said drug candidate to the level of expression in the presence of said drug candidate.